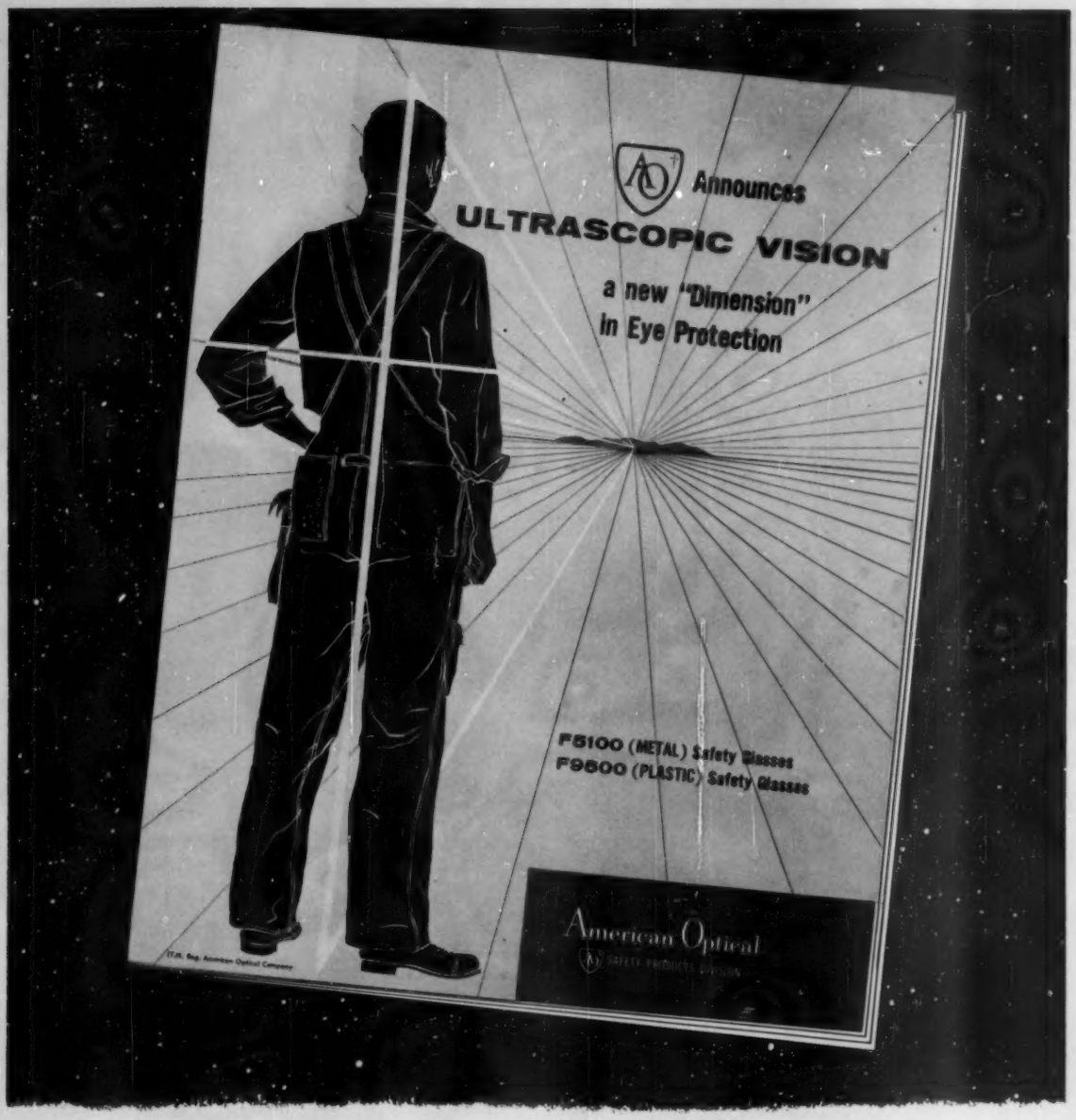
Safety Maintenance and Production

EST. 1951 • AMERICA'S PIONEER MAGAZINE IN ITS FIELD • NOVEMBER, 1955 • 50¢



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†T.M. Reg. by American Optical Company

(For details, use Key # L-1 on card on page 73)

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(For details, use Key # L-2 on card on page 73)

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*203 — *26 April, 1955*

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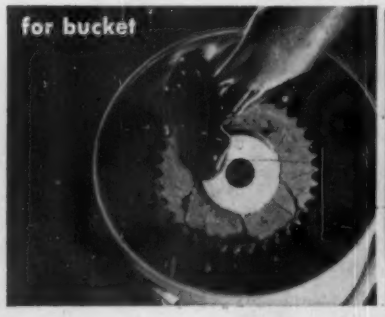

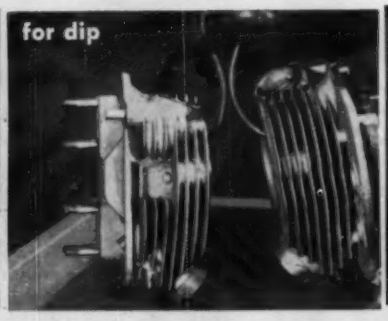

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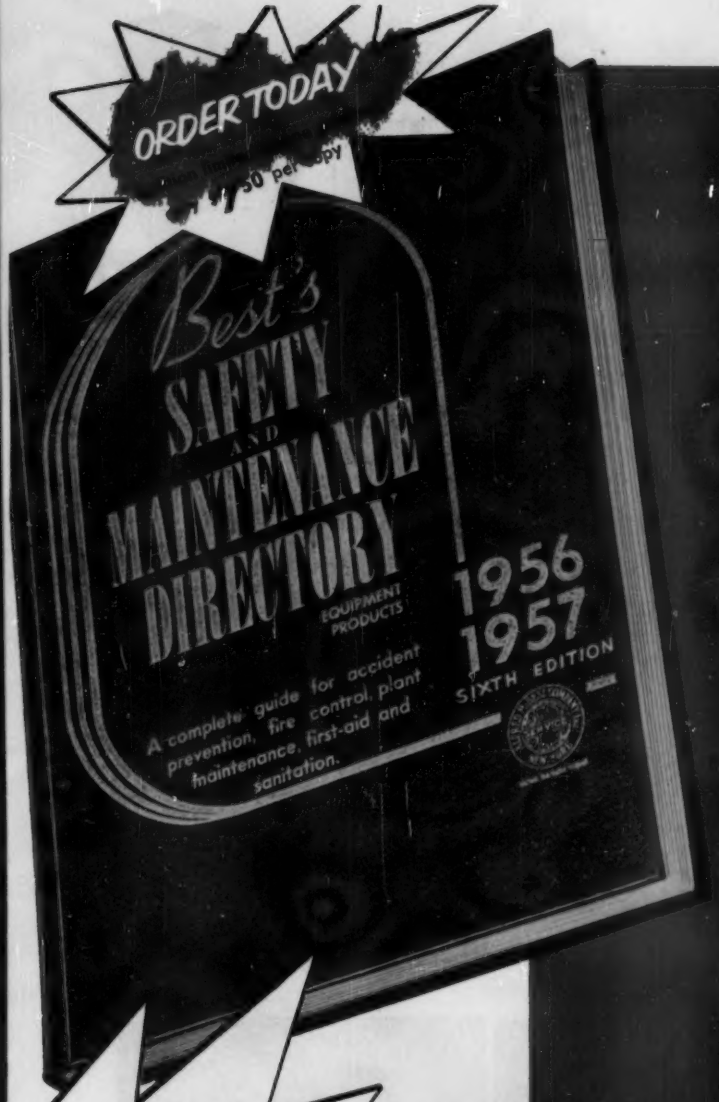

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You get enthusiastic safety cooperation instead of

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YOUR
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PUBLISHED IN THE INTEREST OF YOUR SAFETY
THE JOHN DOE COMPANY, INC.
PROTECT YOURSELF
3
WAYS
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3 Report, avoid or eliminate all unsafe conditions.
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John Doe

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Every employee feels bucked-up by a note from the boss. If you desire, your facsimile signature can be printed here.

Your Signature Here

NOTE:
Your Safety News is designed to promote better employer-employee relations. Every item is carefully weighed from this viewpoint.

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(pages 2 and 3)

So Goes the World
Lions & Machinery have Hungry Jaws
NEVER REACH INTO MACHINERY WHILE IT IS RUNNING!
WANTED
Guard Well
from the CARELESS ACTS of others the WISE MAN corrects his own
SAFETY SHOES
WORK OVERTIME
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FALLS
FALLS KILL 10 EVERY DAY

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Safety Maintenance and Production

formerly "SAFETY ENGINEERING"

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Cover picture by courtesy of Shell Oil Company

AMERICA'S PIONEER MAGAZINE IN ITS FIELD

SAFETY MAINTENANCE & PRODUCTION is indexed regularly by Engineering Index, Inc., New York

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approved and labeled by Underwriters' Laboratories

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DAYTON Fig. 200

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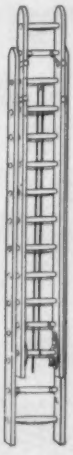
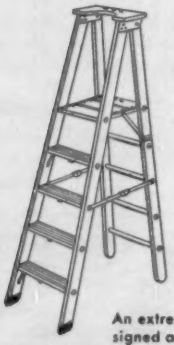


DAYTON Fig. 102

A strong ladder for general industrial use. Side rails are 1⅝" x 2¾" (rails available 1⅜" x 3¼" if desired).



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(Use Key # L-4 on Inquiry Card on page 73)

Charleston, S. C. *November 3–4*

Eighteenth Annual South Carolina Accident Prevention Conference (Francis Marion Hotel). J. Donald Watson, Jr., Secretary-Treasurer, P. O. Box 539, Columbia, S. C.

Kansas City, Mo. *November 14–18*

Eighty-third Annual Meeting of the American Public Health Association and related organizations (Municipal Auditorium). Dr. Reginald M. Atwater, executive secretary, American Public Health Association, Inc., 1790 Broadway, New York 19, N. Y.

New Orleans, La. *December 12–13*

Sixth Annual Louisiana Safety Association Conference. (Roosevelt Hotel). J. R. O'Donnell, Avondale Marine Ways, Inc., P. O. Box 1030, New Orleans, La.

Philadelphia, Pa. *January 23–26*

Seventh Annual Plant Maintenance & Engineering Show (Convention Hall). Clapp & Poliak, Inc., managers, 341 Madison Ave., New York 17, N. Y.

San Francisco, Calif. *February 2–3*

Sixth Annual California Statewide Meeting of the Governor's Industrial Safety Conference (Fairmont Hotel). Department of Industrial Relations, 965 Mission St. (Room 400), San Francisco, Calif.

Atlanta, Ga. *March 4–6*

Southern Safety Conference & Exposition (Biltmore Hotel). W. L. Groth, Executive Director, P. O. Box 8927, Richmond 25, Va.

Los Angeles, Calif. *March 19–21*

Third Annual Southern California Safety Congress & Exhibit (Ambassador Hotel). Greater Los Angeles Safety Council, 610 S. Main St., Los Angeles 14, Calif.

Klamath Falls, Ore. *April 5–7*

Forest Products Safety Conference. George Metzger, Secretary-Manager, c/o Willamette Valley Lumber Operators Association, Eugene, Oreg.

New York, N. Y. *April 16–20*

Twenty-sixth Annual Greater New York Safety Convention & Exposition (Hotel Statler). George E. Decker, chairman, Greater New York Safety Council, 60 E. 42nd St., New York 17, N. Y.

Washington, D. C. *May 14–16*

President's Conference on Occupational Safety.

Rochester, N. Y. *May 22–24*

First Genesee Valley Safety Conference and Exhibit (Rochester Chamber of Commerce Building) William H. Keeler, secretary-treasurer, Rochester Safety Council, 55 St. Paul St., Rochester 4, N. Y.

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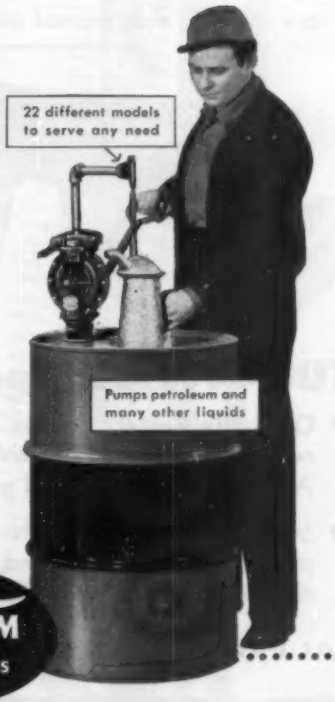

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- **Eye Savers Lenses** . . . methacrylate lenses are safer . . . shatterproof and never pit.

MODEL 440SV — clear frame **460SV** — green frame
Heavy Impact Goggles with replaceable optically perfect, methacrylate lenses. Clear Lens (C) .125" thick.
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MODEL 441SV — clear frame **461SV** — green frame
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MODELS 490 or 491 — opaque black frames
Furnished with Stac-Vent only
Methacrylate Lenses: same as 440
Acetate Lenses: same as 441

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Worn 100% of the time

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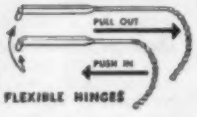

MODEL 415 plastic retrax temples (illus.)
MODEL 412 metal retrax temples
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WATCHEMOKET OPTICAL CO., INC.

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(For details, use Key # L-6 on card on page 73)

Paperwork Piles Up A Safety Record!

ON MARCH 22, 1954, a Certificate of Merit Safety Award, one of the highest-ranking safety citations, was presented by Liberty Mutual Insurance Co. to Purolator Products, Inc., Rahway, N. J. pioneer manufacturer of automotive oil filters and other filtration equipment, for establishing an all-time record of 1,036,476 man hours worked without a loss-time accident within that organization.

A year previously, Purolator was unable to accumulate more than 300,000 man hours worked without experiencing a lost-time accident. Its frequency rate of injury was running more than twice as high as the national average for its particular industrial group.

The company's achievement in the relatively short period of one year in accomplishing such an outstanding safety record is one that bears important notice for all other industries beset with a similar safety problem.

Frequency Rate Analyzed

The safety program actually got underway in June, 1953, with the reorganization of its existing safety program. A careful analysis of the accident reports disclosed that the frequency rate of injury was 23–24, considerably more than twice as high as the national average for its particular group. (8–10). This alarming situation cried for immediate action and remedy.

Top management acted immediately. At a meeting attended by the President, Executive Vice President, Vice President in charge of Operations, Director of Industrial Relations, Treasurer, and Comptroller, the existing safety program was reviewed and analyzed. The first decision arrived at by this group was that the safety program needed an improved medical department under the direction of a competent doctor. This resulted in the immediate appointment of a physician to head up the Medical Department.

Safety policies were then formulated and the overall responsibility for the organization of the entire safety program was placed under the supervision of the Vice President in Charge of Operations.

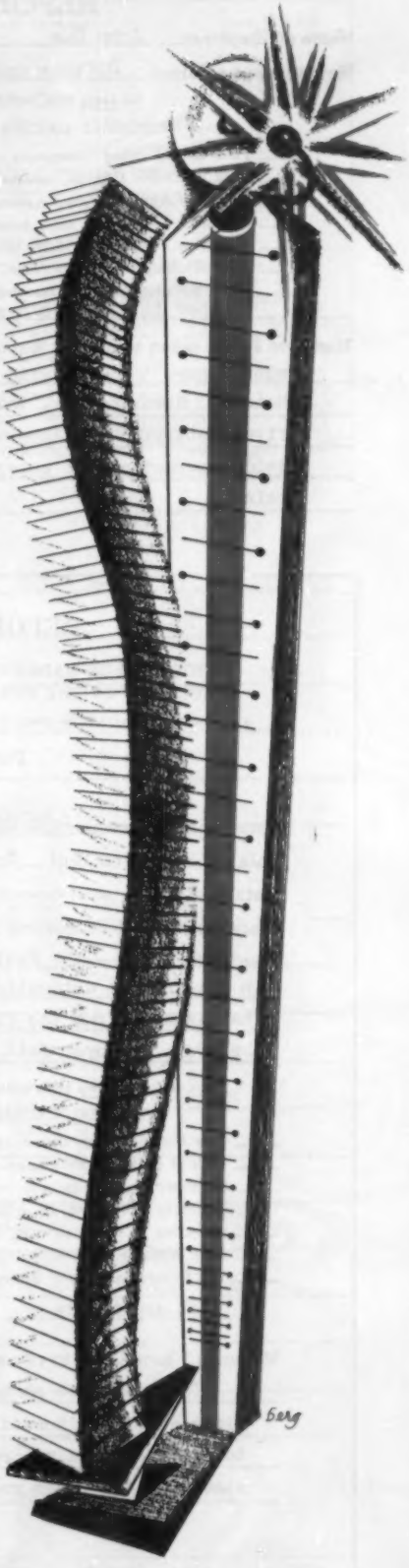
To make the employees aware of the fact that top management was behind the new safety program, a letter containing the policies established at the executives meeting was sent to each employee at his home address.

While the letter was going out, the Vice President in Charge of Operations called a meeting of the Quality Control Manager, the Assistant Factory Managers, the Director of Industrial Relations and the Safety Engineer. It was decided that the development of a comprehensive safety program could best be accomplished through committee action. This resulted in the establishment of a permanent committee called the Executive Accident Loss Prevention Committee under the permanent chairmanship of the Vice President in Charge of Operations.

Designs for Safety

First action of the group was to establish necessary subcommittees based on the organization structure. These were: (1) Department Heads Safety Committee, (2) Supervisor Safety Committee (line supervisors), (3) Employees Safety Committee (hourly and weekly salaried employees). A subcommittee of the Department Head Safety Committee is the Machine Design Safety Committee whose job it is to inspect designs of both new purchased equipment and that built in

(Continued on page 14)



REPORT ON ACCIDENT CHECK UP

Name of Employee John Doe Date 6-3-55

How accident occurred Lifting coil stock, weight 135 pounds, a distance of 21 inches.

(In every case, indicate below (with an X) your opinion as to the direct cause of the accident)

PHYSICAL CAUSES	PERSONAL CAUSES
____ Poor Housekeeping (misplaced material, etc.)	____ Dangerous Practices (undue haste, chance taking, etc.)
____ Lack of Proper Guards (mechanical or electrical)	____ Inability (inexperience, poor judgment, etc.)
____ Improper Apparel (goggles, shoes, loose clothes, etc.)	____ Incomplete Knowledge of Job at Hand
____ Defective Equipment (hand tools, ladders, etc.)	__X__ Disobeying Rules
____ Defective Floors, Stairways, Ramps, etc.	____ Unfit (weak, easily fatigued, easily excited)
____ Poor Working Conditions (light, ventilation, etc.)	____ Not Otherwise Classed (describe)
__X__ Not Otherwise Classed (describe)	

Proper lifting equipment not available

Measures I have taken to prevent a similar accident Reviewing this particular accident with the supervisor, I concur with his recommendation to have installed a monorail and hoists. Nevertheless, this employee should not have lifted the coil stock without first notifying his supervisor that he needed help to perform the loading operation. Held discussion with supervisor and employee in the Press Room reviewing shop safety rules.

Signature John Jones, Safety Engineer

LP 906

REPORT OF ACCIDENT INVESTIGATION

THIS IS TO BE MADE OUT AND TURNED IN NOT LATER THAN THE DAY FOLLOWING THE ACCIDENT BY THE FOREMAN, OVERSEER, OR SUPERVISOR OF THE INJURED EMPLOYEE

(This form does not take the place of the regular accident report to be sent to the insurance carrier, or any legal form required.)

Firm's Name Purolator Products, Inc.

Date 6-2-55

Name of Employee John Doe Check No. ____ Dept. No. 000-00

Date and hour of accident 6-1-55 10 A.M.

Nature of Injury (Brief statement) Low back sprain

Place where accident occurred Press Room

How accident occurred While converting from coil stock to sheet steel, employee in loading the automatic feed had to lift coil of stock weighing 135 pounds. The distance from the floor to the reel was 21 inches. In lifting the coil to the reel, employee felt a pull in his back.

(In every case, indicate below (with an X) your opinion as to the direct cause of the accident)

PHYSICAL CAUSES	PERSONAL CAUSES
____ Poor Housekeeping (misplaced material, etc.)	____ Dangerous Practices (undue haste, chance taking, etc.)
____ Lack of Proper Guards (mechanical or electrical)	____ Inability (inexperience, poor judgment, etc.)
____ Improper Apparel (goggles, shoes, loose clothes, etc.)	____ Incomplete Knowledge of Job at Hand
____ Defective Equipment (hand tools, ladders, etc.)	__X__ Disobeying Rules
____ Defective Floors, Stairways, Ramps, etc.	____ Unfit (weak, easily fatigued, easily excited)
____ Poor Working Conditions (light, ventilation, etc.)	____ Not Otherwise Classed (describe)
__X__ Not Otherwise Classed (describe)	

Not applicable

Measures I have taken to prevent a similar accident

This employee should have asked for help in loading the automatic feed. Since at times it is difficult to obtain help a work order has been initiated to provide for a monorail and suitable hoists for the loading of similar coil stocks in the press room.

Signature Foreman James Roe

These Forms Make Safety Go!

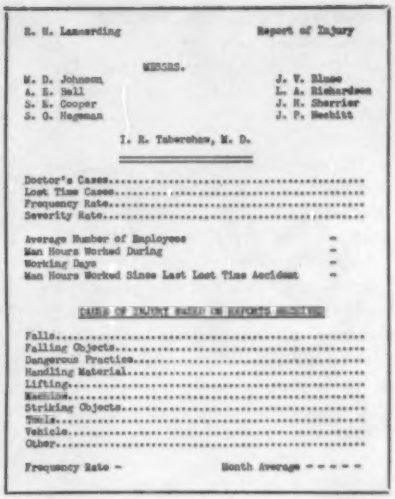
On this page and the opposite one are illustrated some of the most important reasons for the success of the company's safety program, according to Purolator executives. They are the key forms in the constant check the company keeps on accidents and health. Let's see what each one looks like: .....

At Left Top . . . The safety engineer's report on a typical accident. This form makes a competent safety judge (the safety engineer) responsible for deciding what were the causes, what to do about them, and following through on measures to prevent similar accidents. Note the engineer's cooperation with the victim's foreman.

At Left Bottom . . . Here is the supervisor's report on the same accident. It discusses the accident in more detail, places the responsibility, and at the end states specifically what is being done to correct the accident-causing condition.

At Bottom . . . The medical history of the patient again identifies the accident as well as the type of injury. It also follows through in covering the treatment of the injury. Note that all 3 of these reports supplement one another to give a total picture of the accident. They are integrated with:

At Right . . . this report, which goes to high management officials to keep them abreast of the success or failure of the safety program. From such reports as this a yearly tally sheet which tells at a glance what type of accidents have occurred, their severity and frequency, and where correction must take place.



R. H. Lanserding — Report of Injury

MESSRS.

W. D. Johnson, A. E. Bell, S. E. Cooper, S. G. Hageman, J. V. Blume, L. A. Richardson, J. H. Sherrier, J. P. Nesbitt

I. R. Taberchaw, M. D.

Doctor's Cases.....
Lost Time Cases.....
Frequency Rate.....
Severity Rate.....

Average Number of Employees =
Man Hours Worked During =
Working Days =
Man Hours Worked Since Last Lost Time Accident =

CAUSES OF INJURY RATED ON REPORTS RECEIVED

Falls.....
Falling Objects.....
Dangerous Practice.....
Handling Material.....
Lifting.....
Machine.....
Striking Objects.....
Tools.....
Vehicle.....
Other.....

Frequency Rate — Month Average - - - - -

REPORT OF INJURY

Date Employee Reported 6-1-55 Time 10:15 A.M.

Date of Injury 6-1-55 Time 10 A.M.

Name John Doe Dept. Press Room

Address 9 Roman Avenue Occupation Press Operator

Age 31 Wage Rate

Clock Number 000-00 How Long Employed

Foreman James Roe

Patient's Story of How Injury Occurred: I was loading the coil stock on the feeder and had to lift the coil stock pretty high to get it on the reel when I felt this pain in my back.

Nature of Injury: Low lumbar strain

Place Where Injury Occurred: Press Room

Witnesses None

Disposition Sent to Doctor 6-1-55 for diathermy treatment and back strap. To return to Doctor 6-6-55

Remarks None

Date Typed 6-3-55

R.N.
Signature of Person Taking History

Paperwork's Safety Record

(Continued from page 11)

the shop to make certain that safety features are incorporated before the machinery is placed in operation.

To coordinate the activities of all committees, the Safety Engineer is permanent Chairman of three committees and a member of the Executive Accident Loss Prevention Committee. His responsibility is to pass along from one committee to another all the communications, ideas and suggestions that arise out of each meeting.

Here's an example of how this information is communicated between committees: At the Employee Safety Committee meeting, a suggestion is made to provide mechanical hoisting facilities in the press room to avoid back strains and other injuries. Since this Committee cannot approve the expenditure, it is referred to the Supervisor Safety Committee meeting. It is the responsibility of this committee to analyze requests for equipment, to determine the necessity for such equipment, decide whether the equipment will eliminate existing hazards, and then determine the cost of installation. If the expense incurred exceeds the authority of the committee, it is referred to the next committee (Department Heads) with recommendations. The same procedure is followed here too. Generally, recommendations made by lower committees are approved and the necessary paper work authorized.

It has been the experience that 95% of the safety recommendations made by the Employees Safety Committee involve expenses of less than $100.00.

One of the chief reasons for the success of the Purolator safety program is the elaborate use which the company makes of accident and medical reports. The company uses no less than twelve reports to help it keep track of its accident and injury record. These range from regular physical examination reports to a special Classification for Responsibility of Accidents form which has turned out to be one of the most successful tools used by the committees.

This unique check list covers such points as the equipment itself and determines whether that equipment was poorly designed, broken, not properly guarded, or improperly used. Next point on the check list is that of supervision and this determines if the proper instructions were given for the use of the equipment.

Then the check list takes up the subject of the mental and physical fitness (or unfitness) of the injured employee to see if that was a factor in causing the accident. If the accident was caused by someone other than the party injured, he is also the subject of close scrutiny. The Committee then determines if carelessness on the part of the injured worker or other employee was a cause of the accident. It checks to see if the conditions causing the accident could have been avoided or controlled, if all safety rules were closely adhered to and if all protective devices were used. Finally, the Committee checks on the wearing apparel of the injured employee to see if it is improper or unsafe.

Purolator's Medical Department also came in for a complete reorganization under the new safety program and, in fact, is an integral part of that program. More intensified follow-up exams, extra forms, and more complete statistics provide a close check on accidents.

In addition to regularly scheduled physical examinations, employees are encouraged to see the company doctor about their own problems. Or employees may be referred to the doctor by the Safety Engineer for consultation if he feels it may prevent an accident.

The Safety Engineer is responsible for keeping a careful watch over all substances that are brought into the plant.

Mel Johnson, Vice President in Charge of Operations and chairman of the Executive Accident Loss Prevention Committee sums up the company's thinking on the subject of plant safety: "Our safety program is concerned primarily with the elimination of human suffering and secondarily with the prevention of valuable lost-time. From the very beginning of our program, we have emphasized the human factors and considered the economic aspects as secondary. By means of letters sent directly to employees' homes, posters prominently displayed in the plant, and rotation of members on the various safety committees we have tried to make every employee safety-conscious. We feel that all those factors make our program succeed."

Work Clothes Still Going Strong After 1 Year's Use

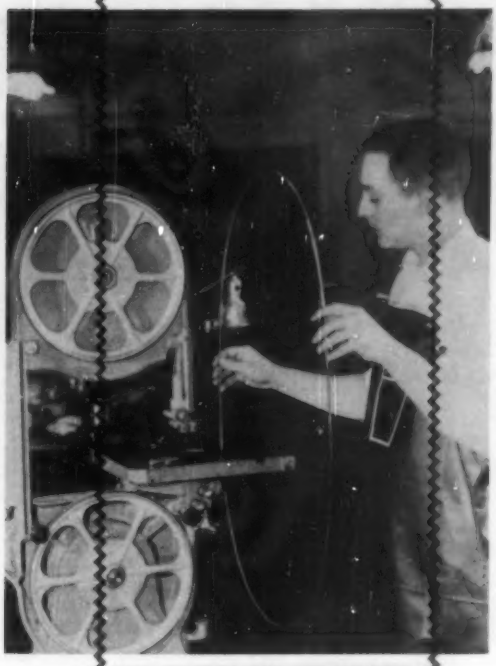
Workers at Stauffer Chemical Company's Brooklyn plant have found a way to put extra pennies in the family bank account without having to ask the boss for a raise. A new acid-resistant uniform of acrylic fiber adopted by the company has proved to be a worker's bonanza. Before the new clothes came on the scene, workers were buying an average of one new uniform every two months. "We bought 140 acrylic fiber uniforms in June, 1954," says G. C. Weber, plant manager, "and gave a pair to each man. If he needs a replacement, he simply turns in his worn clothes. After 15 months we haven't had a single man come to us for a new uniform!"

In addition to the fabric's chemical resistant properties, it is also moth-proof, mildew-proof, and launders easily. Uniforms remain neat and good-looking after repeated washings.

Picture by courtesy of Carbide and Carbon Chemicals Co.

BAND SAW BREAKAGE

...and how to stop it!



The man inserting the new band saw blade above can avoid breaking it, say power tool experts if he is careful in mounting and adjusting the blade.

ANY OF A NUMBER of conditions may cause a band saw blade to break, according to power tool experts. In some cases, blade breakage is unavoidable, being the natural result of the peculiar stresses to which such saws are subjected. But breakage is more often due to avoidable causes such as lack of care or judgment on the part of the operator in mounting or adjusting the blade or guides.

A band saw blade is a delicate piece of steel that is subjected to tremendous strain. Proper treatment is the best assurance of long service life. Selecting blades of the proper thickness and temper for the machine is a prime consideration.

Always use the widest possible, but use narrow blades for small, abrupt curves and for fine, delicate work. Wood-cutting blades should be filed and set when pressure is required to make them cut. "Hard-edge" blades for metal-cutting should be discarded when worn as it is not practical to resharpen them. Broken blades can be brazed or welded, but if the blade has become badly case-hardened, it will soon break in another place. Under average conditions, blades should be sharpened after about four hours of operation.

A reasonable amount of care and attention is the surest way to fault-free performance and accurate work. Over-straining the blade is a common cause of breakage and other poor performance. Tension of the blade should be varied with its width, and for different kinds of blades or work. Intelligent use of the tensioning gauge will eliminate many of the commoner blade troubles. Blade tension should always be relaxed when the machine is not in use.

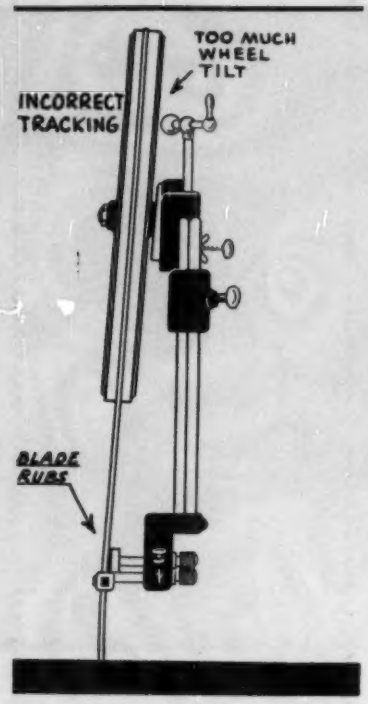
In centering the blade, wheels should be revolved slowly forward by hand to make sure the blade travels in the center of the tires. This operation should never be performed while the machine is running. After blade has been tracked in the center of the wheel rims, lock it firmly in place.

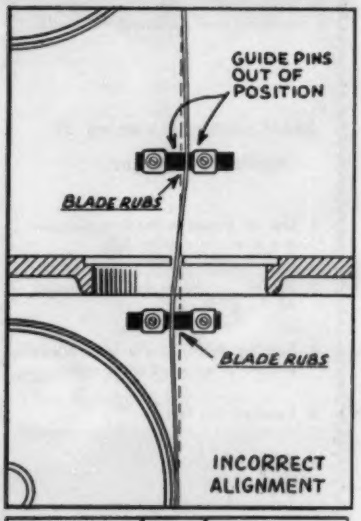
Brackets carrying guide blocks should be adjusted forward until front edges are just behind gullets of the teeth. If guide blocks are too far forward, teeth of the blade will be damaged. If they're too far back, the blade will not be correctly supported for curve-cutting.

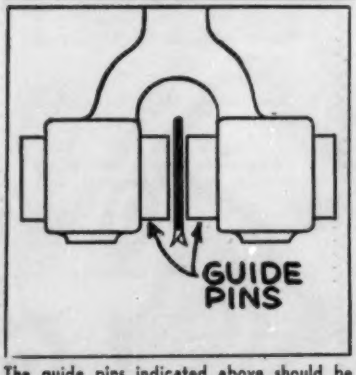
In lateral adjustment, guide blocks should be set inward until they are as close as possible to the blade without binding it. About 1/64-inch clearance should be left

Most common causes of blade breakage:

1. Use of blades without resharpening after they grow dull.
2. Faulty alignments and adjustments of the guides.
3. Forcing or twisting a wide blade around a curve of short radius.
4. Feeding too fast.
5. Insufficient tooth set.
6. Excessive blade tension.
7. Upper guide set too high above the work.
8. Using wrong blade for material being cut.
9. Using blade with lumpy or improperly finished braze or weld.
10. Worn or lumpy tires on wheels.
11. Insufficient tooth separation.
12. Unevenly worn guides which place undue tension on the blade.







The guide pins indicated above should be just back of teeth gullets of band saw.

between the back of the blade and the blade support when the blade is running free without cutting. If allowed to run hard against the support at all times, the back will become case-hardened, causing the saw to break eventually.

Guides should be readjusted every time the blade is changed, especially when blades of varying width are used. After considerable use, guide blocks will become worn at their front edges, causing a tendency to bind on the rear of the blade. Original accuracy may be obtained by reversing ends. When both ends are worn, grind them square or install new guide blocks.

Before starting the machine, recheck adjustments and place guards in position. Turn pulley by hand to make sure everything is in order before turning on the power.

In operation, keep the top guide down close to the work at all times. When using a band saw, do not force the material against the blade too hard. Light contact with the blade will permit easier following of the line and prevent undue friction, heating and case-hardening of the blade at its back edge.

With sharp teeth, very little forward pressure is required for average cutting. Move the stock against the blade steadily and no faster than necessary for easy cutting movement.

Avoid twisting the blade by sawing around sharp corners. Use a narrow blade to saw a very small radius. When cutting curves, turn the stock carefully so the blade will follow without being twisted. If a curve is so abrupt that it is necessary to back up and cut a new kerf repeatedly, either a narrow blade or one with more set is needed. The more set a blade has, the easier it will allow the stock to be turned, but the cut is usually rougher than where a medium amount of set is used.

In withdrawing the piece being cut, take care not to draw the blade off the wheels.

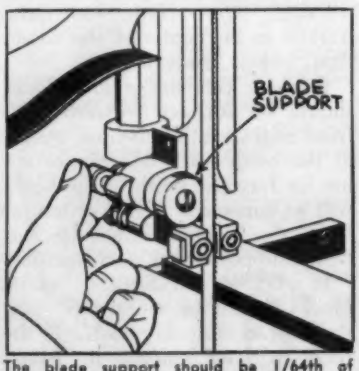
Selection of band saw blades for metal-cutting should be guided by the material to be cut. Such factors as number of cutting teeth, their set and operating speed vary with the particular job to be done.

Metallic hose, for example, is best cut at only about one-tenth the speed that canvas and rubber hose are cut, and requires about twice as many teeth per inch.

Slow speed is needed for metal sawing. An exception to this is the friction sawing technique which makes use of a high velocity blade speed, but for conventional sawing the blade speed should be in the neighborhood of 200 surface feet per minute for average work. Steel requires a slower speed than soft metals, and thick sections demand a slower speed than thin sections. When the blade speed is too high, the teeth are not given time to bite into the metal. The result is a skidding, rubbing action which fails to cut the metal and also leads to rapid dulling of the blade. As a rule of thumb, the softer the metal, the higher the cutting speed.

Blades for cutting thin metal should be selected so there will always be at least two teeth in contact with the edge of the work. If teeth are allowed to straddle the work, they will be torn off and the blade ruined.

Pictures by courtesy of Rockwell Mfg. Co.



The blade support should be 1/64th of an inch from the back of blade run free.

A paper strip between each of the guides and the blade is a good adjusting trick.

For skidproofing, sprinkle ZORBALL *freely on icy, wet walks, drives, etc. — or spread on floors to absorb oil, grease, paint, chemicals.*

Wyandotte ZORBALL underfoot makes icy areas safe!

Eliminate the danger of slipping to both workers and vehicles this winter, with skidproof Wyandotte ZORBALL! A thin layer of ZORBALL on icy walks, platforms, loading and shipping docks, ramps, and driveways will prevent accidents and work delays. And ZORBALL won't cake, mud, dirt, or track!

All-purpose ZORBALL is the safest floor absorbent you can buy! It has no effect on fabric, wool, metal, rubber, or skin . . . absorbs water, paint, oil, grease – any liquid – and it is *fireproof*, even when saturated with combustible liquids. Use it indoors or outdoors . . . on any type surface.

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(For details, use Key # L-7 on card on page 73)

Do Safety Incentive Awards

Large safety certificates are posted where employees can see them, not in the lobby.

Many of the company's incentive prizes are designed to get the housewife interested.

Safety director discusses baseball trips as awards for safety with committee members.

YES, VERY DEFINITELY, says Tom J. Cain, Director of Safety for The B. F. Goodrich Company, Akron, Ohio. An accident prevention promotion job can be speeded up and made much more effective by the use of incentive awards.

The B. F. Goodrich programs are based on the thinking that accident prevention promotion can not succeed without a careful consideration of the role played by the individual workman. It is he, or she, who works safely or gets hurt. People, then, the "Joes" and the "Marys" are the most important part of the accident prevention approach. Guarding, inspections, engineering—all have their place in getting production with safety; but accident prevention efforts all too often fall down because we don't get our communications through to "Joe" and to "Mary"; we don't get our people into the act. Like a good many other phases of American industry, the movement for industrial safety turns from machines or things to people, from engineering to communications or selling.

Injury Frequency Reduced 92%

Goodrich has been using employee interest incentive awards programs effectively for eight years. During this period the injury frequency rate has been reduced 92% to new lows for the company, and less than half the injury rate for the rubber and chemical industries reported to the National Safety Council. The direct costs of injuries have shown a very favorable decline in spite of the inflation which has affected everything including the costs for having people hurt. As Cain reports, this is said not in the sense of boasting but to have you know that incentives for greater safety have paid off.

B. F. Goodrich started in 1947 with a safety-sports contest which provided all-expense trips to three major sports events: The Kentucky Derby, World Series baseball games, and Army-Navy football games for the lucky winners in the division showing the best injury frequency rate improvement by quarters of the year. The winning employees and their wives or friends made these trips. To add some fun to the contest rules, there was a stipulation that for safety the winner had to take his own wife. The foreman of the winning employee also received a similar trip for two persons. Result—the injury frequency rate was cut in half.

Covers More People

The following year it was decided that incentives should be spread to cover more people, and approximately the same amount of money, $6,000, or 50 cents per factory employee, was put up for the purchase of merchandise prizes worth about $10 at retail value, given to lucky winners on all shifts free from disabling injuries for a month. Results—a further reduction of 50 percent in injury frequency rates.

In 1949, as a result of employee suggestion, the incentive idea was spread still further by giving a candy bar each month to every factory employee free from disabling injuries on their shift. A percentage of the candy bars contained slips entitling the winners to a free pair of safety shoes by turning in the slip to his foreman. Persons who were on shifts having had a disabling injury received a package of chewing gum with a message, "Sorry, No Candy. Here's Something to Chew On—Work Safely and Win a Chance on a Pair of Safety Shoes Free Next Month." Results—again the injury frequency rate was reduced by almost 50%.

In 1950, merchandise prizes were distributed based on 50¢ per factory employee as against an average cost of $8.00 per employee per year for direct costs of injuries.

Pay Off?

Safety committee chairman counts some of the silver dollars used in a recent safety contest. The real pay-off was the increased safety contest produced.

In 1951, a Safety Shopping Certificate worth $10.00 was effective. The winning employee went shopping with his or her certificate won by practicing safety. Again, there were no drawing on departmental shifts having a disabling injury, thus encouraging the "lookout for my buddy" idea. To spark divisional interest, two sets, or eight Goodrich tubeless tires were drawn from every division meeting its "par," an established run of clear days based on past performance.

During 1952, U. S. Savings Bonds were the plant-wide awards—$500 in $25 bonds for 15 days clear; $1500 for 30 days, $2500 for 45 days clear. Four runs of 15 days, each equivalent to over a million man-hours clear of disabling injuries were recognized by saving bond drawings.

Appeal to the Sports

During 1953, an interest in spectator sports was combined in the safety promotion program by providing all-expense trips to Cleveland Indian baseball games. The number to go on each trip was determined by a schedule of days clear plant-wide. The winning individuals were determined by drawings and the immediate foremen of the winner went along. One of these trips required five busses and several bushels of peanuts. The letters announcing this plan bore the postmark "Accident, Maryland," and were mailed direcently to the homes of employees. Another town for safety mailing is Safety, Missouri.

The 1954 promotion included silver dollars for safety with a distribution of $500 each month in clear departments. The slogan—"It's Silver For Safety." This project was supplemented by awards of B. F. Goodrich tubeless tires. During one period, candy bars, with slips for silver dollars in a percentage of the bars, were wrapped with a brief safety message. The employee had to read the message to determine if he had a silver dollar coming his way from his foreman.

During 1955, the Safety Mystery Man idea has been used. This plan consists of passing out safety silver dollars to production employees observed working safely or wearing their safety shoes, or knowing the right answer to a series of questions related to accident prevention in their department.

Must Have Fresh Approach

Safety Director Cain emphasizes that such programs must have change—a fresh approach with new advertising is all-important in the use of incentive promotions. No program has been permitted to run longer than one year, and most phases are limited to a quarter, or three months. Remember the rule that while the safety program is getting results is the best time to intensify the activities, not when the record begins to slump.

Does all this pay? Approximately $6,000 to $11,000 every year has been used for these incentive programs at B. F. Goodrich, Akron. The answer is that the rubber industry, and more particularly, The B. F. Goodrich Company, doesn't spend money for nothing. Our safety men are quick to point out that when a disabling injury occurs it goes into the record and there is none of the making a paper record to kid the employees or others concerning results.

Are such programs necessary? Many times you have heard it said: "I never thought accident prevention would come to the place where people are rewarded for doing something they should do for themselves and for their own good." It is easy enough to say, accident prevention is the responsibility of our foremen and we don't need a lot of gimmicks to get the job done.

Gimmicks Help the Job

Aren't we kidding ourselves with such a policy? The foreman is a busy man and needs assistance in the form of stimulation, information, and promotion sales help if he is to sell one of the most difficult of commodities—an intangible—safety. Practically all companies use some type of incentive awards in connection with merchandising. However, their safety men lack the courage or salesmanship, or something to sell the same encouragement for promoting accident prevention. *(Continued on the next page)*

In spite of the successful use of safety incentive awards at B. F. Goodrich, Safety Director Cain is quick to point out that there are many pitfalls in the use of such promotions. As he says, "There is no easy road to accident prevention and you well know it. You're selling an intangible and it takes a super salesman approach. Incentives are the advertising and the sales props. All of the basic ideas in a safety program must be carried out before you start asking employees to buy a product even though of the utmost importance from their point of view, their own personal safety."

Cain says that he is always fearful in discussing the question of incentives that someone may grasp at such a plan as a shortcut, or an easy method. These cautions are important:

1. Incentives aren't the entire answer, all of the basic accident prevention know-how must be used.
2. Minor injuries should not be penalized in such programs.
3. All programs should be designed so as to insure that foremen must make daily personal safety contacts.

While incentive programs and accident prevention promotion offer spark and enthusiasm, they are at best advertising tools only and will surely never replace basic accident prevention training right on the job.

Pictures by courtesy of B. F. Goodrich Company.

New Wire & Cable Developments Revealed

The latest developments in the wire and cable industry were discussed at the fall meeting of the National Electrical Manufacturers Association's Wire and Cable Section before eighty five of the industry's executives at Skytop, Pennsylvania.

A performance standard for magnet wire was discussed by R. L. Reading of the Belden Manufacturing Company. He said, "in view of the numerous materials now available that are considered suitable for magnet wire film coatings, and recognizing the impracticability of issuing standards for each of these new film coatings, a NEMA Wire and Cable sub-committee has been formed to investigate the possibility of writing performance standards for the various thermal classifications (Class A, Class B, Class C).

"As an initial step, a performance standard is being written for film coated wire satisfactory for operation at Class B temperatures."

Dr. George Perkins of the Reynolds Metals Company in discussing the growth of aluminum usage said, "in the magnet wire industry aluminum has proven to be technically sound. Manufacturing problems have been met and solved, often in a manner that resulted in improved operations.

"Forming, joining and assembly have been demonstrated as thoroughly feasible. Operational characteristics of aluminum wound devices have been proven in service."

The chief changes in the new Bureau of Mines Schedule 2-F entitled, "Electric Motor-Driven Mining Equipment Junction Boxes," were reported by E. G. Sturdevant, chief engineer, United States Rubber Company. He said the changes that interested the wire and cable industry are "that it permits the use of a ground trip relay as an alternate to a grounding conductor in a cable for keeping the frames of underground equipment at ground potential, and that it provides for a procedure to govern the use of unapproved or experimental equipment in gassy mines for a six-month period. This trial period may be extended to one year by approval of the Bureau of Mines," he said.

Fred Paradise of Underwriters' Laboratories, Inc., Chicago, reported on U. L. Tests "which simulated the abuse conditions that flexible cords would suffer in actual usage. The data that will be obtained will be used as a basis for selecting appropriate cords for various types of electric appliances," he said. "This work may ultimately affect U. L. standards and cord designs."

In discussing the trend towards super high-tension cables, Robert J. Wiseman, of the Okonite Company, said, "The electric cable industry is now studying methods for improving the materials used for insulation. It is reviewing the manufacturing methods employed, and is investigating the thermal and physical properties of the soil surrounding the cables to find how to get the highest possible current-carrying capacity out of the power circuit. These studies will take a few years. After they are completed, the electric utilities plan to conduct tests that duplicate operating conditions so that it will be possible to meet the doubled capacity that forecasts show for 1965."

"Rubber insulated cables, especially in the 2 to 35 kv range, are being used more and more as the electrical industry expands. It is anticipated that the output for Class I systems in the United States will approximate 900 billion kw-hrs in 1963," stated G. J. Crowdes of Simplex Wire & Cable Co. "Such a load will need efficient design of the electrical, mechanical and thermal characteristics of rubber insulated power cable."

He said that many comparative tests and field experience show that butyl and oil base rubber differ in their properties. Butyl insulation has greater resistance to heat and aging, deterioration from moisture, ozone and corona. "The dielectric strength of the two materials seems to be reasonably close. The dielectric constant and power factor are lower for the butyl insulation and the resistivity is higher," he said. "Finally, these properties permit the butyl insulated cable to operate at higher temperatures for normal, emergency and short-circuit loads."

Proposed changes in the 1956 National Electrical Code as they affect wire and cable were discussed by C. W. Zimmerer, associate electrical engineer, Underwriters' Laboratories, Inc., New York, N. Y. He said that the proposed changes will include a complete re-arrangement of the sections relating to wire and cable, for the purpose of making this information more usable.

In addition, the following new items are among the more important proposals recommended by the Code-Making Panel No. 6: 1. A section on temporary wiring; 2. A heat-resistant, rubber-insulated wire (Type RH-90) for use at 90C; 3. Establishment of maximum temperatures for copper and aluminum conductors; 4. Tables for the current-carrying capacity of insulated aluminum conductors.

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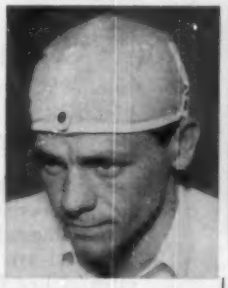

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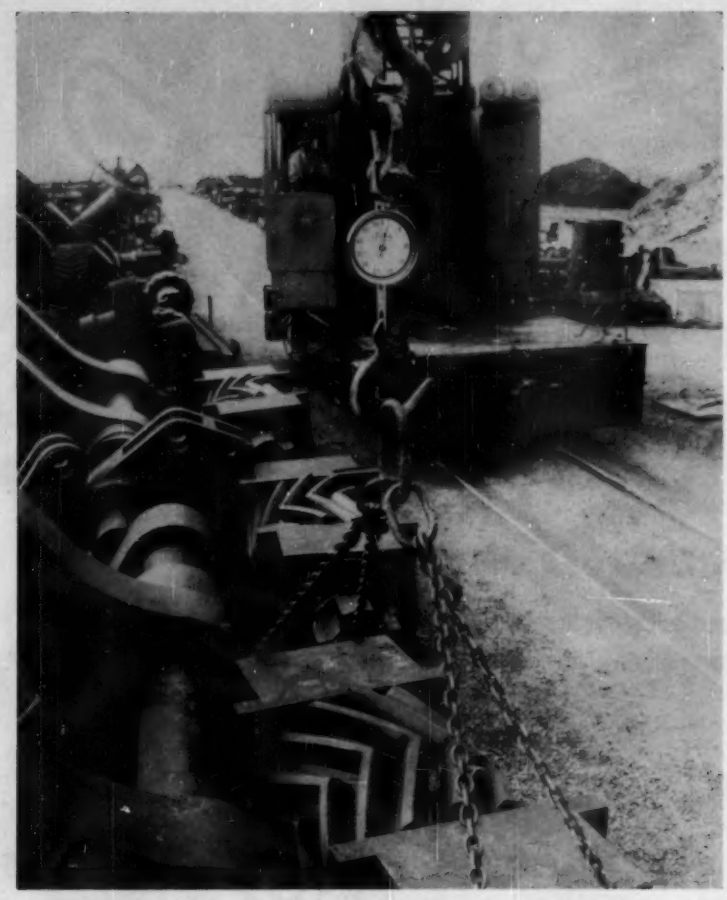


Crane is protected while lifting heavy steel loads in picture above by gauge near handling hook which operator can read at a glance to see if load is too heavy for crane to lift safely.

As operators of heavy materials handling equipment know many expensive cranes have been damaged by dumping while lifting excessive loads. This has happened in spite of weight-radius charts posted in the cabs.

This danger has been virtually eliminated in the yards of The Timken Roller Bearing Company at Canton, Ohio. In the accompanying illustration, the testing device, used as a scale, is positioned directly in series with the load and between the lift hooks. It instantly indicates to the operator if the load is beyond the weight-radius capacity of the crane.

Although the particular meter used at Timken Bearing is of an 0–50,000 lb. capacity, these instruments are also available in 12 other ranges, from 0–500 up to 0–100,000 pounds, each individually calibrated for accuracy. All will withstand accidental overloads of up to 25 per cent without injury to calibration, and actual safety factor is several times the rated capacity, according to the manufacturer.

Photo by courtesy of W. C. Dillon & Company, Inc.

Injury Rates Climb Up in Second Quarter

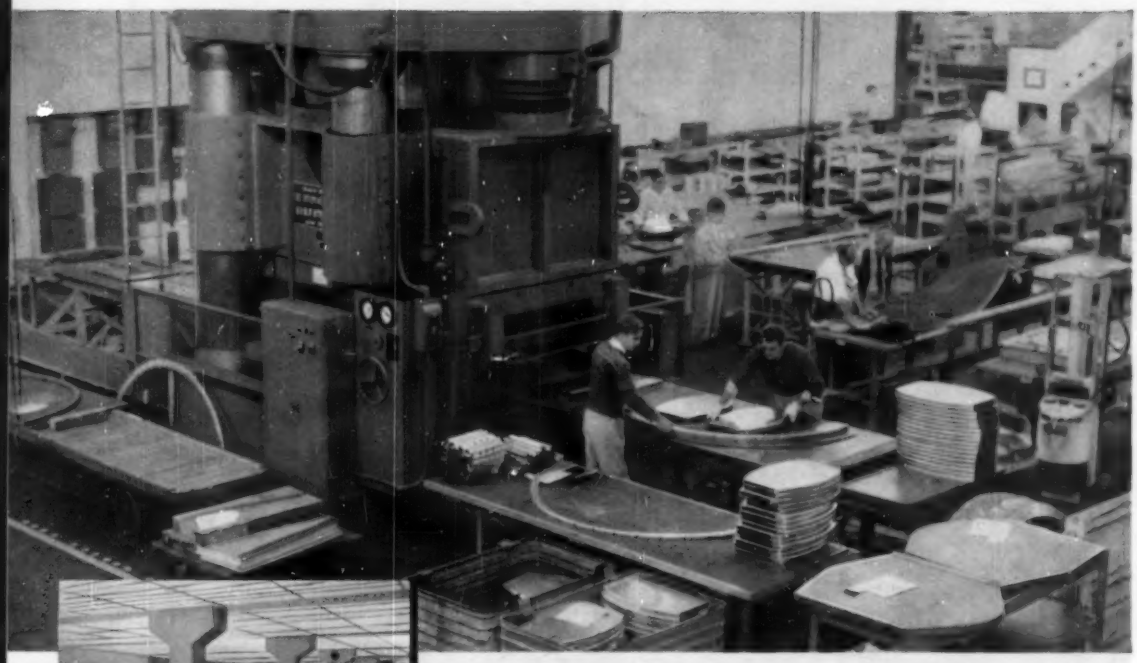
The injury-frequency rate for manufacturing rose 5 percent, from 11.1 disabling injuries per million man-hours worked in the first quarter of 1955 to 11.6 in the second, according to preliminary reports received by the U. S. Department of Labor's Bureau of Labor Statistics.

This was the second quarter in succession in which the injury rate has increased; however, the average of 11.4 for the first 2 quarters of 1955 was equal to the record January-to-June low established in 1954. The increase from the all-time record low (10.0) of December 1954 has been gradual.

"Although this increase is not alarming, and the level of injury rates is still low, these figures clearly indicate that we cannot slacken our safety efforts if we wish to maintain or improve the splendid safety record which industry has achieved," Secretary of Labor James P. Mitchell warned in commenting on the figures. "Increased employment, the hiring of new workers, and generally stepped-up activities in industry undoubtedly contributed to the rise in injury rates. However, this very fact calls for intensified safety training among new workers and attention to safety factors in new processes. There must be no let-up in our efforts to save the life and limb of our workers. Despite the overall increase, many industries have achieved enviable safety records and are keeping their injury rates at low levels, a challenge to other industries."

Of the 127 individual industries for which quarterly rates were computed in the survey, 50 showed increases of 1 full frequency-rate point or more between the first and second quarters of 1955, 58 showed little change, and 19 recorded significant decreases. Six of the 9 industries in the primary metals group showed increases of 1 full point or more; 4 of the 6 in the lumber, 9 of the 15 in the machinery, 8 of the 16 in the fabricated metals, and 3 of the 6 in the furniture group showed significant increases.

For copy of booklet described opposite use Key # L-9 on card on page 73. →



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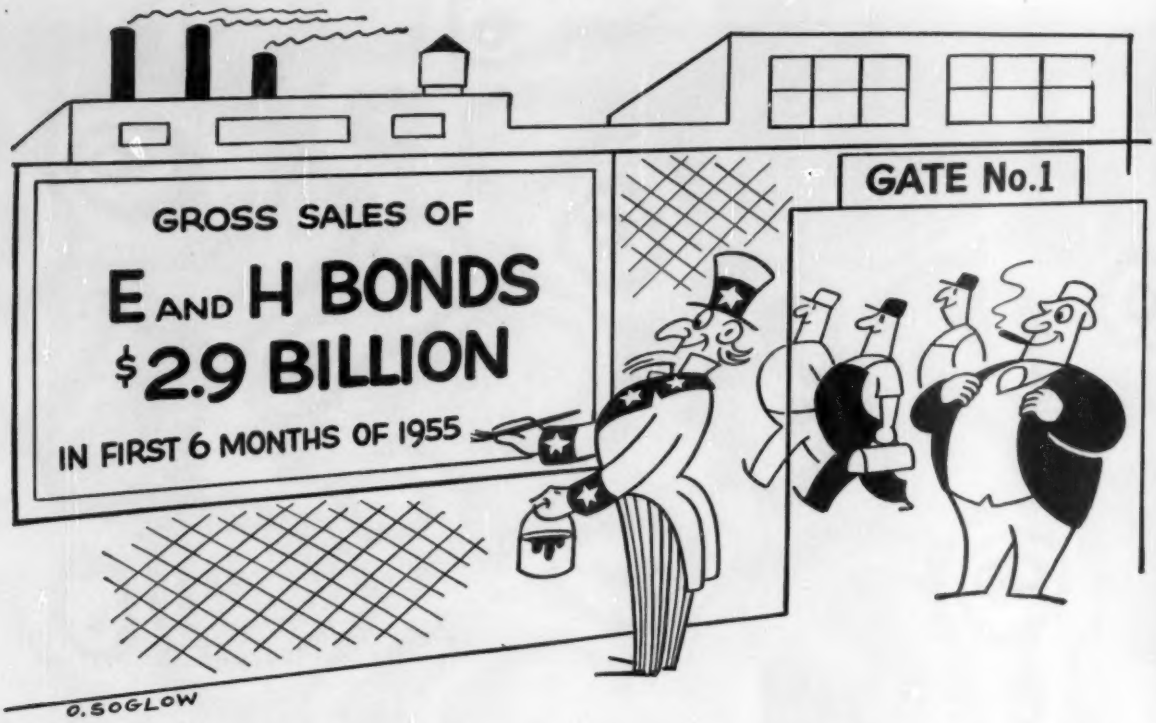

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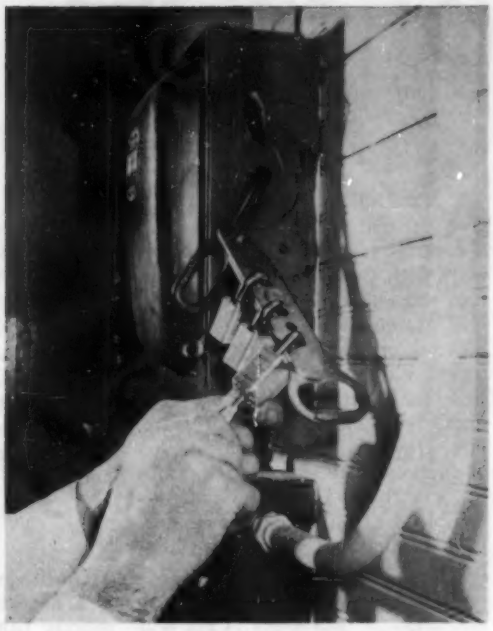
Safety Maintenance

LOCK OUT

the switchbox hazard



Six men can lock out the switchbox at right with the device shown. Although one lock is being removed it is impossible to turn on any power until all locks are opened one at a time by each of the maintenance men working on the line.

A 10-POINT PLAN to eliminate one of the major hazards confronting industrial maintenance men has been proposed by Samuel Stahl, president of the Master Lock Company, Milwaukee, Wis.

The danger stems from the fact that switchboxes control power to electrically driven machines. Thus, the possibility exists of a control switch, physically remote from a machine, being turned on while a maintenance man is repairing that machine. This is a frequent cause of industrial maintenance injuries and deaths.

Avoiding this type of electric switch hazard is a puzzling problem. Companies trying such methods as posting warning signs and removing fuses have failed to prevent accidents. Somehow, someone throws on the switch while repairmen are still at work. Padlocking switchboxes "is the only positive protection measure," according to the National Safety Council.

Master Lock, which has supplied padlocks to thousands of plants, recommends these steps in establishing foolproof electric switchbox safety systems.

1. Make each worker responsible for his own safety by providing him with his own padlock, either combination or key-type.
2. Issue only one key for each lock. The supervisor, however, should keep a master list of key numbers, and the extra key to each lock in his department. But the extra keys should never be loaned out for any reason. Keep extra copies of combinations, where combination padlocks are used, in the hands of a single supervisor.
3. If a supervisor uses the extra key during emergencies, the old lock and extra key should be destroyed and replaced. This precaution eliminates the possibility of the original key turning up and removing the safety padlock at the wrong time.
4. Check to see that no two locks and keys are the same. Best insurance against duplicate locks and keys is to purchase padlocks made by a reputable manufacturer.
5. The company should purchase all padlocks for its employees, rather than let them supply their own. This insures high quality padlocks such as the laminated, pin-tumbler type, that cannot be opened or broken.
6. Establish a careful clearance policy when two or more workers, or departments are involved. Faulty clearance systems often cause casualties even though every man has his own padlock.
7. Require each man to attach his own padlock to a switch control, even though it is already locked. (Steel tongs should be attached to switchboxes to accommodate more than one lock. This can consist of two pieces of ⅛-inch metal with the necessary number of padlock shackle holes.)
8. Impress each employee that even though someone else has already locked the controls, he will not be protected unless he attaches his own padlock.
9. Prevent men going off a job at the end of a shift from removing their locks until those on the next shift have attached their locks.
10. Identifying individual padlocks is suggested in large plants where the controls may be some distance from the operation under repair.

Picture by courtesy of Master Lock Co.

by E. S. MOORHEAD
District Manager
Hoisting Equipment
The Yale & Towne Manufacturing Co.

their proper inspection,

ANY DOCTOR WILL TELL you that the human body is a deceptive piece of equipment to work with. Some men appear calm, cool and collected, but upon intensive examination the doctor finds they not only have ulcers, but their ulcers have ulcers. To discover this, the doctor finds clues in a man's behavior, his blood pressure, etc. However, a real internal examination is necessary to be sure of exactly what the patient's trouble is. To a layman, there may be nothing at all wrong with him; he looks fine.

The chain fall is somewhat in this category, but I would say it is more "honest" than the human body. The majority of its ailments can be spotted by anybody. For instance:

IF the brake is worn, it starts to slip gradually.

IF the hoist is a "wetbrake type" and lowers hard, it indicates a need for lubrication.

IF the hook is open, it has been overloaded or the hook is improperly loaded.

IF the chain is stretched, it doesn't seat properly in the load sheave.

All of these things give you a nice **visual** warning; but, like a man with ulcers, there is a possibility that the internal parts have been damaged or badly worn. Like a doctor, you will never know until the hoist fails unless you **look inside.**

The obvious answer is routine internal inspection. This is only part of the answer however. Again, like a doctor, we have to find a way to prevent this trouble in the future, to give our patient a long and useful life.

Inspection

On-the-job inspection of a hoist is a necessity. Many unsafe conditions can develop on the job. We're whistling in the dark if we depend on the hoist to stay in safe condition after it leaves the storage area.

To assist in this spot checking, our company has developed a check gauge. The purpose of this tool is to compare chain stretch, chain wear, and hook opening, to the maximum safe limits for a particular hoist. The gauge has two points, set apart at the maximum safe length for a given number of links. A small slot in the end of the tool is the minimum safe link size, and is used for measuring the wear at the bearing points of the chain. The overall width of the end of the gauge is the maximum safe hook opening.

Twisted instead of straight oil groove on top pinion is one indication of hoist failure.

These dimensions are based on these "rules of thumb":

1. Chain 3 percent or more longer than its standard length is unsafe.
2. Links worn to 20 percent below standard thickness are unsafe.
3. Hooks opened 35 percent more than standard opening are unsafe.

While we set the figures above as rules, our common sense tells us that whenever we spot stretched chain, worn links, or opened hooks, the safest thing to do is replace them. Why gamble with lives and equipment?

This tool, as designed, is good for only two sizes of hoists of a particular make. Each hoist manufacturer may use a different pitch chain or different type hook, so one needs a set of gauges for each make hoist.

It is advisable to have, not only a safety inspector covering the hoists throughout the yard, but to have someone in each working crew, usually the leader, keeping an eye on the hoists for defects.

On-the-job inspection should check:

1. Check chain for wear, stretch or damage to links.
2. Check hooks for opening.
3. See that both top and bottom hooks are carrying the load at the hook center and not on the hook tip.
4. Check handwheel action. The handwheel has a back movement (or play) of 1 to 1 and a half pockets before the handwheel strikes the check washer lug. If it has to turn 3 pockets or more, some of the brake parts are worn and need replacing.
5. Check action of hoist. If it lowers hard it usually means lack of lubrication in brake. If you have excessive pull in both directions it can mean lubrication, or it may be a bent driving pinion.

CHAIN HOISTS

maintenance and use...

All hoists being returned to the rigging loft at the completion of the job, and hoists being sent back as defective by on-the-job inspection should receive:

1. Chain inspection as above.
2. Hook inspection as above. Replace, don't reshape hooks.
3. Take handwheel off and examine brake parts including pawl, galvanized iron disc, ratchet disc, leather disc, and replace worn parts. Also check the pawl action to see that it properly engages the ratchet disc. It may be that a new pawl spring is indicated.
4. Take gear cover off and examine gears for wear.
5. Knock out driving pinion and examine for twist or damage. Twisting can be easily spotted in our hoists and I assume others too, by the straight oil groove along the length of the driving pinion. If this is twisted replace the pinion.
6. If chain has been stretched, look for worn load sheave pockets. If the pocket shoulders are worn down, replace sheave.
7. Also, stretched chain indicates worn load chain guide and stripper.

   You should have ⅛ inch clearance between load chain guide side and the outside diameter of the load sheave.

Now that you've been inside the hoist, replaced worn parts and reassembled the hoist, we are ready for the 50 percent overload test.

Testing a hoist without internal examination is like an ostrich sticking his head in the sand. This is no protection at all.

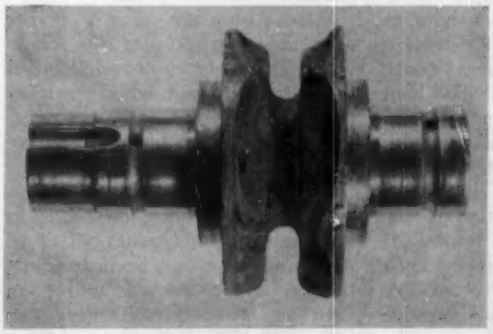
Picture a pawl that is worn, and a pawl spring that is weak. It happens to engage the ratchet disc during your test, but when it gets on the job it misses. This and other borderline defects can pass the external test you make; examination of the inside working parts should be made first.

Our company, and, I believe, most other manufacturers, load test hoists to 50 percent overload on a long ton basis. We use weights and test the hoist not only for carrying the load statically, but for the brake action as well, by manually operating the hoist in the down direction.

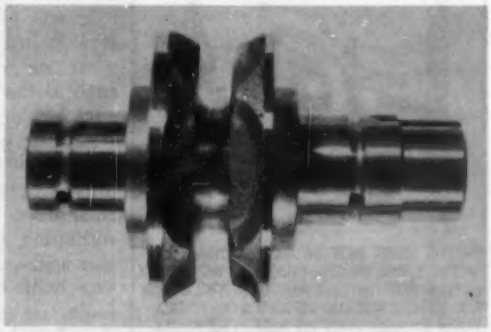
There are other, more convenient ways of test loading hoists. I understand some places use an hydraulic loading device. Others have a type of strain gauge. Regardless of the type, I strongly recommend that hoists be test-operated under 50 percent overload.

Maintenance

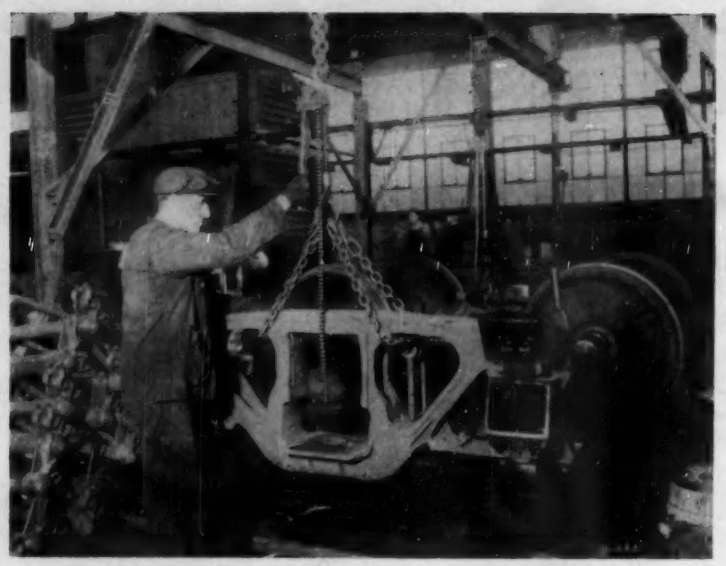
The usual recommendation for the frequency of complete inspection of the chain hoist in normal shops is: hoists in severe or continuous service, once a week; hoists



The worn sheave above shows pockets which can cause the chain to slip at critical moment when hoist is used.



The perfect new sheave above is a definite contrast in safety to the extremely worn and dangerous sheave opposite.



in frequent daily service, but not continuous, once a month; hoists in average or partial daily service, every 3 months.

However, in shipyards, due to the nature of the work, overloading is so apt to occur, and damage from dropping or rough treatment almost bound to occur, that I recommend a hoist receive a complete checkup repair and test each time it is returned to the hoist storage area.

Good maintenance pays dividends in longer hoist life as well as giving protection to the user. How long would a car motor run without oil? The first stroke of the piston would start the wear on the cylinder wall. The motor would last a few miles and then—the junk heap. A hoist chain has moving parts, steel against steel. Without lubrication the wearing time is one-20th the life of a lubricated chain.

If you allow stretched chain to stay in use, you create excessive wear on more expensive items, such as the load sheave. The load chain guide and stripper will also wear out fast. You don't save by keeping worn or stretched chain on the hoist.

Another unsafe practice is the reshaping of stretched hooks. If you will examine a stretched hook you will usually find cracks or faults on the inner hook surface that has been under tension, the outer surface has been compressed. Now, when you reshape the hook, you reverse this condition, i.e., inside under compression and outside under tension. This mechanical damage, these cracks, do not disappear; the reheating does not eliminate these weakening defects—they are still there. Furthermore, the reheating itself is apt to take away the effect of the original heat treatment, giving you a soft weak hook. It's just not worth it. Why gamble with lives and equipment to save the price of a hook?

I have been asked about annealing. Some users periodically anneal hooks, chain, shackles, etc. Speaking only on the subject of hand hoist hooks, **don't do it.** Annealing started way back when wrought iron was used both for chain and hooks. Its purpose was to relieve the work hardening on the wearing surfaces. In the case of wrought iron the annealing did not weaken the material.

For today's steel hooks and chain, majority of which are heat treated for strength, annealing is wrong. The effect of work hardening on steel has never been found seriously detrimental. Annealing serves no purpose but to take out the effect of heat treating.

KNOTS MUST NOT BE TIED IN CHAINS. IF THE LINKS OF THE CHAIN DO NOT WORK FREELY WITHIN ONE ANOTHER, THE CHAIN HAS BEEN OVERLOADED AND STRETCHED. SUCH CHAINS MUST BE REMOVED FROM SERVICE IMMEDIATELY.

Safe Use

There is more to this hoist problem than mechanical maintenance however. It is the human problem. The shop may do a fine repair job, but what about the cause of the damage in the first place?

When hoists are thrown 30 feet over the ship side to the dock, when the hoist is overloaded 6 times its rated load, when the hoist is left in 3 inches of water overnight, something besides maintenance is needed.

When a man is not held responsible for equipment, he tends to be careless in his treatment of it. As painful as it may seem to some, the keeping of records will go a long way toward controlling this attitude. When the user knows hoist number 62 is assigned to his

crew and that it must be checked in when he's through with it, he knows that the condition of the equipment is his responsibility.

This record keeping can be simplified by using a repair parts check sheet form with space on it for comments, dates out and in, number of hoist, name of user. The hoists should each have a permanent number marked on them.

These records will help analyze any hoist problem. They will show the job, the crew and what damage was done to each particular hoist. Another benefit will be an indication of which hoists hold up the best.

Beyond the keeping of records, if possible, a meeting of leaders to educate them on hoist inspection might be a good idea. This could be worked through the safety department with the safety engineer instructing, or worked jointly by both safety and hoist repair departments. But the very act of giving hoists special consideration by a meeting of this kind will gain the hoist more respect from the men that use it.

The control of overloading and other misuse, again will depend on the "on-the-job" inspection by the safety department and crew leaders. It will be up to these men to spot misuse and correct it.

Have them watch the angle of the load chain with the horizontal. The greater the angle, the smaller the chain capacity. For instance with the chain at 60° with the horizontal, you have 86 and a half percent of chain strength, at 45° you have 70 percent, at 30° you have 50 percent, at 15° you have 25.8 percent, at 10° –17.3 percent, 5° –8.7 percent. So if you use a 3 ton hoist, you don't have 6 tons with this arrangement as some think, you have a fraction of 6 tons depending on the angle of the chain. At a 30° angle you would have only 3 tons instead of 6 tons.

To reduce this hazard, first set your supporting shackles as close together as possible to increase the angle of your load chain with the horizontal giving you maximum chain capacity. Second, select your hoist capacity, not only by the weight to be lifted, but also take into consideration the angle of pull with which you have to work.

There is another lesson here which should be applied on all jobs. First, the load chain of the hoist should not be used as a sling chain to cradle the load where this can be avoided. The reason is twofold. You are apt to strain links by bending or twisting with this side thrust; the links also may become scarred or mutilated in such a way as to reduce their cross section. The saying is still true, "The chain is as strong as its weakest link."

This mutilation of the link is particularly true where the object cradled is square or flat in cross section, i.e., has sharp corners.

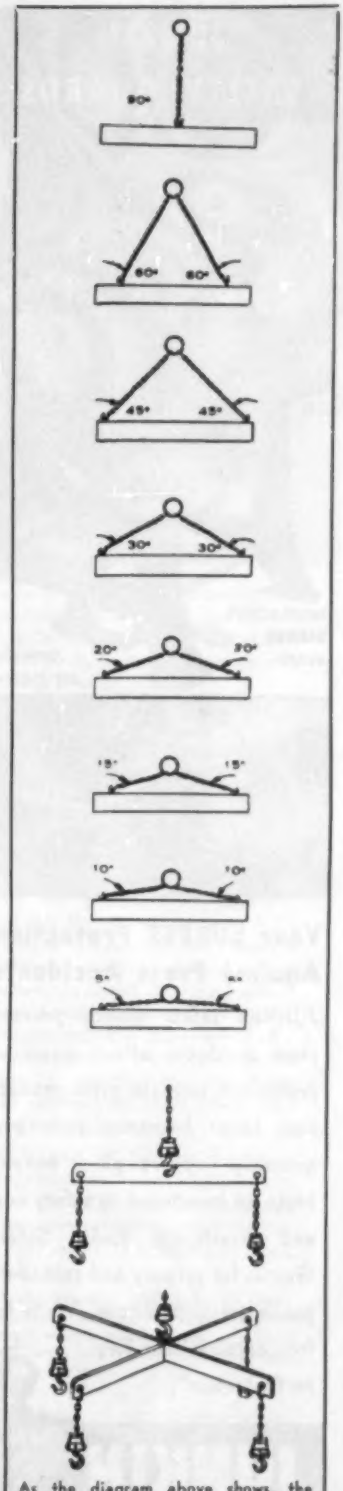
To reduce chain damage it has been suggested by one user that heavy canvas pads be placed between the chains and the load to protect both the chain and the piece being lifted. This pad also helps to spread the load on the chain and to prevent abrasive wear on the chain. It has also been suggested that the chain be heavily greased.

Let me briefly summarize what I have suggested:

1. Inspection of hoist on the job by crew leaders and safety inspectors.
2. Complete inside and outside inspection each time hoist is brought in from job.
3. Test to 50 percent overload after complete inspection.
4. Assign numbers and keep records of hoists including description of repair and record of user.
5. Take the angle of pull into consideration in selecting size of hoist for job.
6. Protect load chain from damage when used as cradle or sling by use of pads.
7. Don't use the hoist chain as a sling or cradle unless there is no other way.
8. We do not recommend reshaping of hooks.
9. Give importance to "the proper care and use of the chain hoist" by holding meetings with your leaders and safety department.

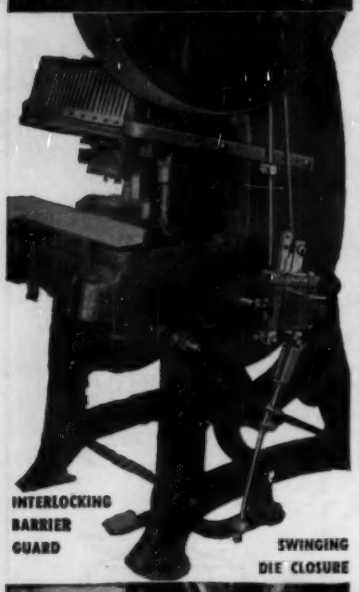
Pictures by courtesy of Yale & Towne Mfg. Co.

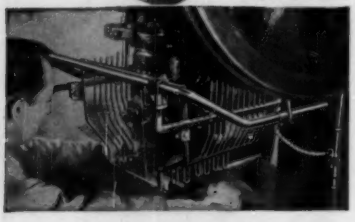
From an address at the 1955 Greater New York Safety Convention.



As the diagram above shows, the greater the angle at which the chain meets the load, the less of the full strength of the chain is available to hold the weight. Danger of chains breaking over sharp edges of the load is also increased by sharper angle.

JUNKIN
SAFETY GUARDS





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JUNKIN safety guards prevent press accidents, afford maximum protection, increase press production, lower insurance costs and generally improve plant morale. Make an investment in safety now and investigate Junkin Safety Guards for primary and secondary punch press operations. Write for free catalog "The Key to Protection".

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(Use Key # L-10 on Inquiry Card on page 73)

WHAT'S THE LAW?

Compiled by HENRY M. GROSMAN
Counselor at Law, Newark, N. J.

MEMBER . . . . . Master Superior Court, New Jersey American Bar Ass'n, New Jersey Bar Ass'n, Chairman, Committee on Workmen's Compensation, New Jersey Bar Ass'n National Federation Insurance Counsel Past Commander, American Legion, Post 10, ... Newark, N. J.

WILFUL MISCONDUCT—Burden of Proof

The wife of a deceased coal miner was awarded benefits for the death of her husband, even though the employer contended that death benefits were unwarranted because of the wilful misconduct of the dead man. The miner had been told by his foreman to quit working a certain room in the mine because of the dangerous condition of overhanging rock there. The employer contended that the disobedience of this order caused the employee to lose his life when the rock fell and crushed him. The court ruled that before compensation can be denied under the compensation law, it must appear that such misconduct, if any, was wilful. In this case, the court ruled there was no wilful misconduct and death was compensable.

HOODENPYLE V. PATTERSON, Tennessee Supreme Court, March 11, 1955.

It appears, therefore, that the employer should not have allowed the miner to continue working in the dangerous room. The fact that the dead man was told not to work there was not sufficient reason to relieve the employer from responsibility in this case. The employer should not have allowed the employee to work in that room under any circumstances.

OVEREXERTION—Enough Evidence

A claimant, employed to keep a railroad yard clean, was injured when he lifted an "extra big" bundle of refuse he had gathered in the yard. He was awarded compensation for his injuries. He was 71 years old and the bundle he lifted weighed between 90 and 100 pounds. The evidence showed that he felt a "terrific" pain in his head, neck, back and legs as he lifted the bundle to his back and that he felt shaky and weak. The court held that the evidence was sufficient to support the findings. He was awarded compensation for injuries resulting from extra heavy effort, strain and exertion, while engaged in the regular course of his employment.

LIPIARZ V. INTERNATIONAL MILLING COMPANY, New York Supreme Court, Appellate Division, Third Judicial Department, No. 61–1, April 1, 1955.

The case above again illustrates the rule that an employer takes a man subject to all his infirmities. In this instance, a younger man probably would have felt no ill effects from the job. However, since the employer had hired his elderly worker, he must accept full responsibility for him when he is injured, although a younger man would not have been affected.

Jobs for Handicapped

Answers to common questions about employment of physically handicapped workers are provided in the new publication "The Handicapped Man for the Job," of which nationwide free distribution is being made by the National Association of Mutual Casualty Companies.

Most People Handicapped

The new booklet points out that most workers are handicapped to some extent, in that all are not physically qualified for all types of jobs, but that within the limitation of each handicapped person remains considerable usefulness and productivity. It answers such questions as: why should handicapped workers be hired, what do insurance companies think about handicapped workers in business and industry, what is the relation of second injury laws to the employment of handicapped workers, how can the individual company go about finding a place for a handicapped worker, what do insurance companies do to help handicapped workers get back to work, what are others doing about handicapped workers, and what assurance is there that job placement for handicapped workers is worth while?

Reducing Loss Important

"As industry and business assume more responsibility for the heavy costs of accidents, occupational diseases and the degenerative changes of employees, the necessity of reducing loss becomes more critical," the booklet points out. "Whenever an injured worker is rehabilitated and returned to productive employment, everyone gains. The earnings of the worker are restored, production is increased, workmen's compensation losses are diminished, and future compensation rates are benefited."

Copies of "The Handicapped Man for the Job" may be secured from the National Association of Mutual Casualty Companies, 20 North Wacker Drive, Chicago 6, Illinois.

EDMONT CASE NO. 582: World famous breakfast food manufacturer (name on request) job-tested No. 151 plastic impregnated gloves against leather faced gloves being used to handle kraft shipping containers. Result: Bought 113 dozen pairs within next 60 days after the test proved their greater comfort, safety and much longer wear.

Cost drops when gloves fit job

No. 151 Werx. Plastic impregnated.

No. 36 Monkey Grip. Plastic coated.

No. 930 Redmont. Neox (reinforced neoprene) coated.

Correct selection of the work gloves used by employees pays valuable dividends to management. After making the test of job-fitted gloves referred to in Case No. 582, above, the manufacturer reported: *"We found the No. 151 gloves were light and comfortable to wear, afforded excellent gripping action on the kraft containers, and wore considerably longer than the leather-faced gloves formerly used for which we paid approximately the same price. We have added this item to our inventory as a regular supply, and find that there are many other places in the plant where they can also be used to advantage."*

OVER 50 TYPES of Edmont job-fitted gloves are available to meet specific needs, palm coated or fully coated with Neox, various plastics or rubber, to resist cutting, abrasion, heat, cold, oils, acids, caustics, other chemicals.

EDMONT CASE NO. 600: Handling steel products in open tank dipping operation. Gloves previously used wore 2 shifts. Edmont job-fitted gloves coated with red Neox (reinforced neoprene) lasted 10 shifts.

MAKE THIS FREE JOB-TEST: Send description of your job operation, materials handled, temperature condition. Without cost, we will recommend correct gloves and supply samples for on-the-job testing.

Edmont Manufacturing Co., 1256 Walnut Street, Coshocton, Ohio

World's largest maker of coated industrial gloves, available through your industrial supplier.

Edmont

Edmont job-fitted gloves

(For details, use Key # L-11 on card on page 73)

ILO Recommendations for Safety and Health

An International Labor Organization panel of experts composed of eight leading specialists from as many countries has recommended to the ILO a series of measures to promote occupational safety and health throughout the world.

The measures include the establishment of regional institutes on occupational safety and health to coordinate ILO technical assistance activities in this field, the preparation of an international encyclopedia on occupational safety and health, and the adoption of an international convention, supplemented by a recommendation to governments, to prevent the sale, hire and use of machines not equipped with safety devices.

Coordinate Assistance

The experts have suggested that the need for coordinating assistance in occupational safety and health with that in related fields might be met by creating regional safety and health institutes, which would be permanent institutions, staffed by a team of experts in safety, health, welfare, training, management, etc. The teams could cover much wider ground than the individual experts hitherto sent out, and might prove more economical in expert manpower in the long run and have more lasting effect.

The meeting noted that numerous difficulties attended both the selection and the work of technical assistance experts. The very rapid development of technology, especially in fields such as electronics, nuclear energy and automation, has created an enormous demand for technicians, in high-paying industry as well as in public service.

The experts felt that the publication of an encyclopedia of occupational safety and health would constitute one of the most useful tasks which the ILO could undertake at the present time. The work should prove useful to industrial physicians, safety engineers, educationalists, administrators and students as well as to managements who had a vital part to play in this field.

They said the encyclopedia should take account of the wide variations in industrial conditions from country to country and from undertaking to undertaking.

The meeting noted that since the adoption by the ILO in 1929 of a recommendation concerning responsibility for the protection of power-driven machinery, the movement towards built-in safety had made considerable progress throughout the world. There was now a substantial volume of national safety legislation on the sale and hire of various kinds of industrial equipment.

Protect Safe Builders

Where built-in safety was compulsory it protected firms building safe equipment against competition from those building unsafe and therefore cheaper equipment. The experts were unanimously of the opinion that whatever responsibility was placed on manufacturers, none should be taken away from users.

The experts felt that it was desirable to adopt an international

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(For details, use Key # L-12 on card on page 73)

convention on the prohibition of the sale and hire of inadequately guarded machinery and other industrial equipment. The convention should be a simple one and confined to points on which there was general uniformity in practice throughout the world, that is, (1) the guarding of projections on revolving parts, and (2) the guarding of gearing.

Code Revision Possible

With regard to the possible revision of the model code of safety regulations for industrial establishments, the meeting drew up a list of supplementary points which might be incorporated in the code with particular reference to the textile and welding industries, on the basis of proposals made by the ILO Textiles Committee and the Permanent International Commission on Acetylene, Fusion Welding and Allied Industries.

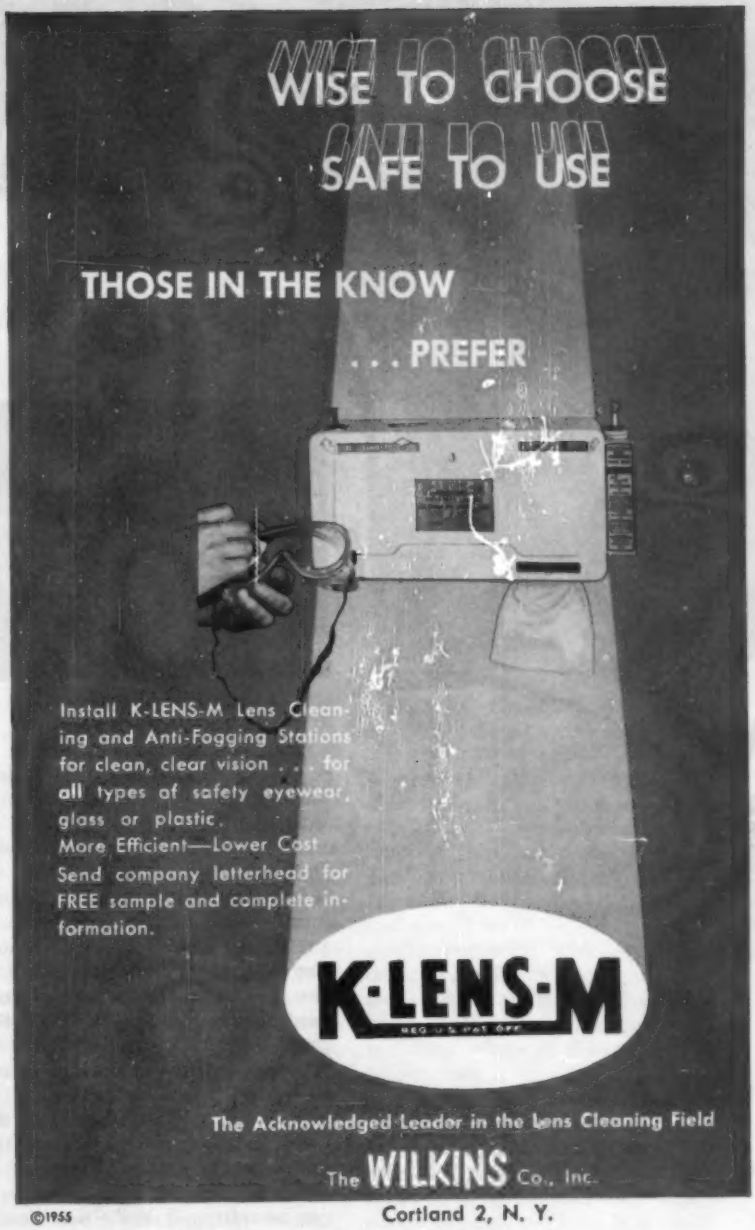
The panel also made a series of suggestions on the classification and labeling of dangerous substances and on the preparation and maintenance of a basic list of such substances.

Help Wanted

Your hobby, preoccupation, or annoyance with terminology and nomenclature problems can help an important military project. Ordnance engineering cuts across many fields of science and technology, and information for design work is drawn from many diverse fields of knowledge. If your subject field might be of interest in ordnance work, and if you have either formal or informal collections of terminologies, glossaries, specialized dictionaries, or even references to them, please contact: Allen Kent, Associate Director, Center for Documentation and Communication Research, School of Library Science, Western Reserve University, Cleveland 6, Ohio.

Several months ago, the Army Ordnance Corps initiated the preparation of a comprehensive Ordnance Engineering Design Handbook to summarize fundamental principles and basic design data. The handbook is being written to provide needed information to army ordnance and arsenal personnel and to the engineering staffs of contractors having ordnance design responsibilities. It is planned that the handbook will consist of approximately 180 sections of about 100 pages each. Completion of the first edition of the handbook is expected to require about five years. The format is designed to facilitate revision of individual sections as future developments may require.

It is a matter of considerable importance that uncertainties as to the meaning of terminology and nomenclature do not impede ordnance design and development. It is no easy matter to establish definitions for many ordnance terms that are also used in other areas of science and technology.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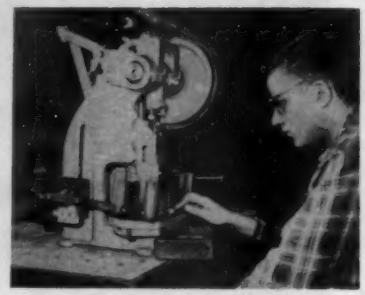
KEEPING UP WITH...

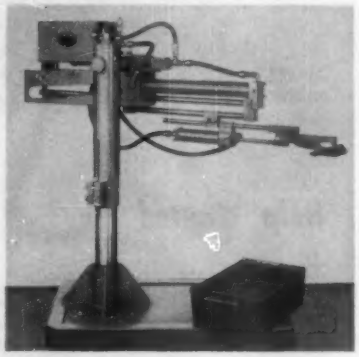


DROP-GATE GUARD

The addition of a drop-gate electric-solenoid guard to their line of punch press safety equipment is announced by Searjeant Metal Products, Inc. The guard is so designed that it surrounds the die area when in the down position, preventing operators from reaching in the ends. Incorporated in the guard is a positive electric control for the operation of the press and a built-in single-stroke attachment. The downward action of the gate causes a switch to energize a solenoid that trips the press. The upward action of the guard resets a relay mounted in the control panel so that the press can be retripped on the next downward action of the gate. The design permits very fine adjustment, so that only when the barrier is within ⅛" or less of the bolster plate will the press be put into motion.

The guard comes prewired, ready to attach to the press. Both installation and maintenance are simple. Units are available for all size presses from bench type up to presses of 100 ton and over. For presses of over 30 ton, the press clutch mechanism is activated by an air cylinder, in which case the downward action of the guard, as it touches the bolster plate, causes the current to operate a solenoid air valve. The single-stroke feature is also available with air-operated clutch mechanism. Guard can be actuated by hand on bench presses or by foot on larger presses.

For details, use **Key # MG-1** on Inquiry Card on page 73.



PRESS AUTOMATIC UNLOADER

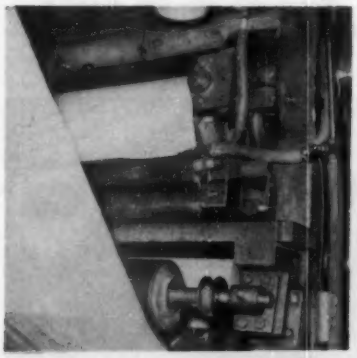
A completely redesigned, portable press unloader with a new swiveling feature for side or back unleading has been announced by Sahlin Engineering Company, Inc. The unloader is suited for job shop use because it can be moved quickly from press to press and is easily adjusted for different jobs. It is also recommended for use with back-geared presses where the gearing prohibits the mounting of standard overhead Iron Hands.

The new unloader, known as the Series 3000 Iron Hand, has the same jaw, air cylinder and controls as the standard overhead Iron Hand used in the automotive and appliance industry to unload large stampings. The entire unit is

Recent Developments in Machine Guards

mounted on a heavy steel base, on wheels, and can be rolled to a press. It can be adjusted vertically to suit the die height, and swiveled into unloading position. Since the jaw travel is in a straight line, the unloader can remove small parts at high speeds. After a ram completes its down stroke, the hand moves into the die and grips the stamping. When it has clearance, the jaw lifts the stamping, moves back out of the die and drops the stamping in a tote box. Then it returns to its original position to await the next cycle. A variety of jaws are available.

For details, use **Key # MG-2** on Inquiry Card on page 73.



CALENDER THREADER

Although calender threaders have been in use for a number of years, the McAfoos Sales & Engineering Co. has engineered the device to new standards of safe operation and maintenance. Originally hand operated, the threaders in 1950 were successfully operated hydraulically.

Now the units are constructed of aluminum and stainless steel for less weight and easier handling, and the latest models are operated by compressed air. Both as safety devices and as production tools, these threaders are widely used in the paper and other industries that calender their products.

For details, use **Key # MG-3** on Inquiry Card on page 73.

IMPROVED TWO-HAND TRIP

Simplified maintenance is the feature of a newly improved safety guard for power presses. The guard is made by the John Humm Safety Equipment Co. and consists of a two-hand safety starting device. It is designed for operations that require the worker to place his hands within the danger zone of the descending ram for feeding. In order to operate the press, the worker has to utilize two separate starting handles, one for each hand, and this design gives positive assurance that his hands will be out of the danger zone.

The equipment consists of an equalizer unit, the two extension handles, and a square cross-bar that turns in self-aligning bearings. The latest models have a replaceable oilite bushing on the sliding cross-bar for easier maintenance.

For details, use **Key # MG-4** on Inquiry Card on page 73.

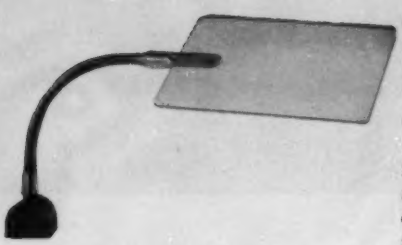
PLASTIC GUARD MATERIAL

A transparent, scratch and abrasion resistant glazing material, suitable for a broad range of safety applications, was recently announced by the Homalite Corp. The new material, Homalite CR-39, is made of thermosetting resins and should be of special interest to safety engineers and equipment designers using or specifying protective glazing. It should also interest architects concerned with buildings where explosion hazards might exist.

Company spokesmen say that the new product is immune to chemical action. Since it is also virtually unaffected by welding splatter, it should find wide application in metal-working. It is easily machined and has "light-piping" and "edge-lighting" qualities, recommending its use in instrument panels and faces. It is light weight and highly resistant to shatter, abrasion and scratches.

Homalite CR-39 is envisioned for use in such applications as safety goggles, and shields, instrument faces, grinding wheel guards, windows for viewing dangerous processes, cab glazing on power shovels and cranes, and numerous similar uses.

For details, use **Key # MG-5** on Inquiry Card on page 73.



FLEXIBLE ARM SHIELD

The flexible arm and magnetic mounting base make this eye shield fully maneuverable. Made by Standard Portable Cord Co., Inc., the new "Flexible Arm Magic Eye Shield" is especially suited for use on tool grinders, large lathes and other machinery where a mounting location is not available close to the work. The ease with which the arm moves enables the workman to adjust the shield to keep it over the work area at all times.

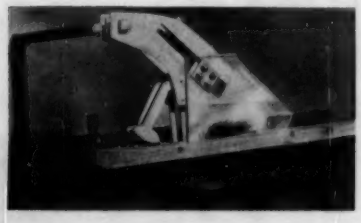
The unit has a 10 by 12 inch CR-39 Cast Optics shield. The 12 inch flexible arm is coupled to a 45 lb. lift Alnico V guaranteed permanent magnet. This model is also available with a permanent mounting fixture in place of the magnet base.

For details, use **Key # MG-6** on Inquiry Card on page 73.

TRANSPARENT SAW GUARD

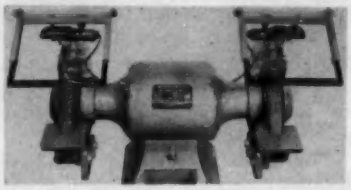
Table model circular saws can be made safe with a new gliding-action guard which lets user see all work operations clearly through transparent plastic shields. Providing many safety features, the Safety Glide Guard serves to protect during cut off, ripping, dado, and grooving work to various widths and thicknesses. It is never necessary to remove the guard and thus risk injury, according to General Scientific Equipment Co.

For extra safety, unit is equipped with unusually large and strong dual "anti-kick backs." An adjustable splitter conveniently adjusts to clear work when not in use. Tough, breakproof shields of ¼" clear plexi-glas operate separately or together. Mounted on table, floor, or ceiling, installation is fast and simple, for either tilting table or tilting arbor. Sealed ball bearings require no oiling.



Two models are available, one for commercial use and a lower priced unit designed especially for home workshop 6" and 8" saws.

For details, use **Key # MG-7** on Inquiry Card on page 73.



ADJUSTABLE GRINDER SHIELD

The Saf-Sight shield is a versatile eye and face protective guard for general-purpose pedestal and bench grinders. Made by the Junkin Safety Appliance Co., the safety shields are easily mounted and can be adjusted for various grinding wheel operations.

A laminated safety glass and a replaceable cover glass are held in a sheet metal frame. The mounting arm and bracket are attached to the grinder wheel guard by means of two bolts. When desired, the unit includes a light mounted below the shield. The narrow frame for the shield allows plenty of room for the operator's hands and work. It can be set at any height or angle, including side work.

For details, use **Key # MG-8** on Inquiry Card on page 73.

OVERLOAD SAFETY SWITCH

Purpose of the new Dyna-Switch, made by W. C. Dillon & Co., Inc., is to prevent overload damage to costly hoisting equipment by automatically cutting out lifting power whenever the safety maximum is exceeded. This is done by means of a massive U-shaped bar of high grade tool steel, heat treated to flex millions

of cycles without losing its resiliency. Attached between the load and the hoist, it trips a sensitive micro-switch whenever the bar is deflected beyond its pre-set operating point, thereby breaking the lifting circuit.

Accuracy of the new 20,000-lb. capacity model is within ½ of 1%, with a safety factor of 3½ to 1. This safety factor is managed by a free-riding stop bolt at the open end of the U-shaped bar. This bolt restrains the bar against deflecting more than 21,000 lbs. even though much greater loads are imposed. Lifting eyes of the Dyna-Switch are electrically welded in position. Dimensions of this compact instrument are only 18¼" long x 6¼" wide x 2⅝" deep and with a net weight of 20½ pounds. For 110 or 220/440 volt power supply.

For details, use **Key # MG-9** on Inquiry Card on page 73.

TWO-HAND PRESS CONTROLS

More than a guard, this electrical control combines safety for the operator and equipment, a means of easy manual operation of the machine, and increased productivity, according to the man-

ufacturer, Micro Switch Div. of Minneapolis-Honeywell Regulator Co.

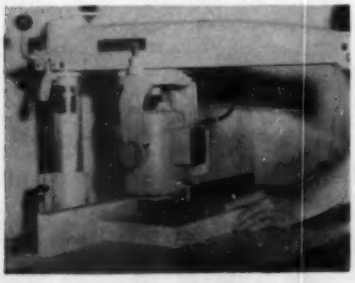
Some of the features of the "Trip Control" are: 1. Safe manual operation of the machine. The control requires the operator to hold both hands on the switches, out of the danger area, during the downstroke. 2. "Fail-safe" control. Accidental operation cannot occur as a result of a component failure. An operation can only result when everything in the control is working properly. 3. "Anti-cheat" feature. Switches cannot be tied down or otherwise by-passed in order to operate the press. 4. "Set-up and run" system. It offers protection for the set-up man and the dies while the dies are being changed. This system also prevents an accidental stroke of the ram when the motor is started. 5. Increased productivity through the reduction of operator worry and fatigue and the instantaneous electrical response of the controls. The feather-touch, finger-tip actuation of the control switches is accomplished with ounces of force and a fraction of an inch of movement. 6. Versatility through instantaneous selection (behind locked control box door) of all the combinations required for any type of clutch, any number of operators, and most punch press operation.

The manufacturer provides complete packages—including control box, hand and foot control switches, limit switches and clutch actuating equipment—ready for quick, easy installation.

For details, use **Key # MG-10** on Inquiry Card on page 73.

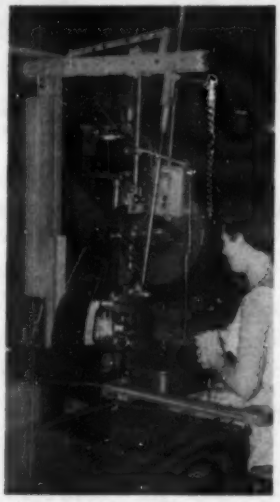
SHAPER-JOINTER FENCE

Dewalt Inc., producers of woodworking equipment for industrial and homeshop applications, have introduced a new style jointer-shaper fence, replacing the standard wood guide when their radial-arm circular saw machine is to be used for shaping or jointing. With the motor in vertical position, and a shaper or jointer head attached to the spindle, the material is fed along the fence and through the cutting knives.



The height of the fence acts as a safety guard in protecting the operator from the moving parts of the machine which are positioned behind it. The long, rigid fence is supported at both ends, eliminating "whip." Because the fence fits into the wood table top, there is an unusually large bearing surface for the stock.

For details, use **Key # MG-11** on Inquiry Card on page 73.

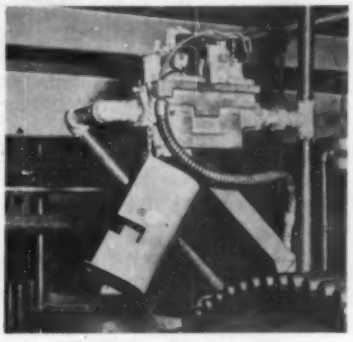


SMALL PRESS PULL-OUT GUARD

Safeguard pull-out guards are now available with a new "Junior" cam mechanism for short stroke presses, from the Safeguard Mfg. Co. These new guards are adapted to presses of one- to two-inch stroke. They are said to provide complete protection from press repeats on clutch failure but allow rapid production. Under favorable circumstances, some operators have been known to feed over 2500 pieces per hour.

To guard short-stroke presses safely, the Junior Safeguard provides a ten to one pull-out ratio with the first motion of the press ram, followed by a complete dwell for the remainder of the stroke. This action results in no pull on the operator unless his hands are in actual danger. The guard structure and mechanism are rugged enough either to remove the hands from the danger zone in an emergency, or actually to stop a press of the size illustrated.

For details, use **Key # MG-12** on Inquiry Card on page 73.

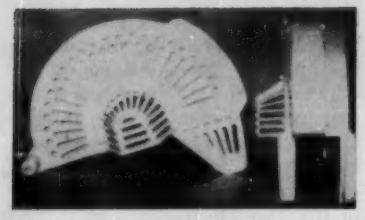


SAFETY PRESS VALVE

Increased safety for operators of large metal stamping presses is provided by a new protector air valve made by The Clark Controller Company. The company also revealed a new anti-repeat control for presses incorporating transistors instead of moving parts. The new controls are intended for use on all presses which have clutches or brakes, or a combination of the two, operated by air pressure.

For safety reasons, presses are automatically stopped at the end of each stroke by an electrically-operated valve, which exhausts air pressure to release the clutch and set the brake. Another stroke cannot begin unless each man working on the press has both of his hands depressing pushbuttons. Clark Controller's new development adds a safety unit to the operating air valve. This is a second valve, also capable of releasing the air pressure from the press clutch and of setting the brake. This valve stands by in normal operation, but operates instantly to stop the press if the operating valve fails to function properly.

For details, use **Key # MG-13** on Inquiry Card on page 73.



NEW SWING SAW GUARD

Some plants are finding it advisable to use the radial saw for dado work. To provide safety for the operator on such work, the Surty Mfg. Co. has developed a metal saw guard with a wider hood to accommodate this type of work. The other features of the guard are in accordance with the code of the American Standards Association.

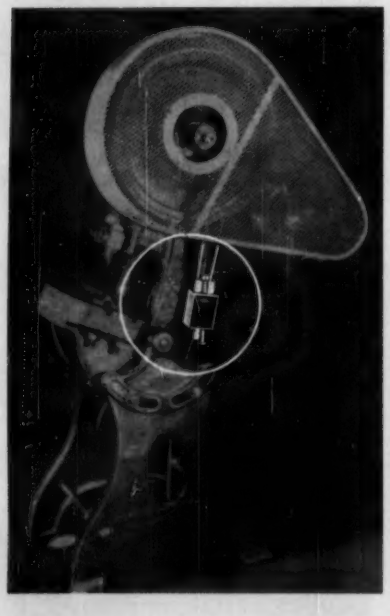
For details, use **Key # MG-14** on Inquiry Card on page 73.

NON-REPEAT UNIT

A major hazard in the operation of power presses, shears, riveters and similar machines is the danger of the unexpected second stroke or repeating. This danger can be successfully overcome by the use of a non-repeat device, according to the Surty Mfg. Co.

The unit prevents the machine from repeating when the operator holds the foot or hand lever down too long to allow the clutch to re-latch properly and securely. The device is said to contain no delicate wiring or parts that would fail quickly under continued use and vibration.

For details, use **Key # MG-15** on Inquiry Card on page 73.



STANDARDIZED GUARD PARTS

Both barrier guards for presses and enclosure guards for belts, flywheels and other moving or rotating machinery can be constructed from the simplified, standardized parts available from Harrington & King Perforating Co. With these parts and simple hand tools, guards can be made to meet the needs of each company's individual requirements. Drawings and special fabricating equipment are unnecessary.

For shear, punch press and die guards, the perforated metal is available in various types of slotted designs. For large enclosure guards, the standard parts include: smooth sheets of 22 gauge (and heavier) steel perforated with round holes; sturdy angles perforated with screw holes; perforated bands with holes to match those in the angles and sheets, to act as frame members and reenforcements; corner gussets perforated to match the angles and bands; and sockets that can be riveted or bolted to the frame and fit into posts mounted on the floor.

For details, use **Key # MG-16** on Inquiry Card on page 73.

SAW GUARD AND GUIDE

Most operations on a circular table saw can now be guarded by a new type of safety guard. The Brett-Guard Company has introduced "the Brett-Guard and Guide" for table saws with blades of six to sixteen inches diameter.

Exclusive features are the guard standard of cast aluminum, and the transparent shield of shatter-resistant one-half inch thick Plexiglas plastic which covers the saw while allowing full vision and complete accuracy in a wide variety of operations, such as mitering, cross cutting, compound mitering, ripping, rabbeting, tenoning, dadoing, feathering, diagonal sawing, template cutting, drop sawing, plowing and tonguing.

For details, use **Key # MG-17** on Inquiry Card on page 73.

RADIAL ARM SAW GUARD

A free-floating action guard for radial arm circular saws has been developed by De Walt, Inc. The guard consists of two metal circular safety rings free-mounted on each side of the saw's hood. These floating rings adjust automatically for depth and angle of cut, giving continuous protection on the lower part of the saw blade, while the upper part is completely enclosed in a metal hood.

For details, use **Key # MG-18** on Inquiry Card on page 73.

Achievements and Awards

We welcome case histories of programs that have done a good job for you in preventing accidents. Merely address your letter or memorandum to The Editor, Safety Maintenance, 75 Fulton St., New York 38, N. Y. and enclose with it an outline of how you organized and launched your safety programs or actual literature you used in publicizing them. Safety is a cooperative venture—what helps one helps all.

SAFE DRIVER AWARD
JOHN SMITH
has driven with a genuine regard for the lives and property of others and has had no accidents for one year
INSURANCE COMPANY

Innumerable accidents have been prevented and hundreds of thousands of dollars have been saved through the medium of safety incentive plans throughout industry. Not only industrial management but casualty insurance companies, as experts in safety, have been in the forefront to institute various types of incentive programs, commensurate with the size and nature of the casualty insurance policyholder.

Public relations and incentives play a vital part in the safety program which is begun by casualty insurance companies immediately upon underwriting their risks. The service includes distribution of posters and bulletins, supervision of safety meetings and release of films dramatically highlighting various aspects of accident prevention.

In addition to incentive programs within the industrial plant, similar plans have been initiated for fleet and automobile risks. In many such companies, annual anniversaries are observed during which there are chosen the "safe drivers of the year." Based upon no chargeable accidents as defined by the National Safety Council, the safe driver of the year is chosen if he has completed successfully a full year without any of those accidents. A special presentation ceremony is held and usually the driver of the year is awarded an appropriately designed pin with the number of safe driving years he has achieved shown on the emblem, and upon completion of 25 or 30 years of safe driving, the winner receives a trophy or a specially engraved plate as a further mark of distinction. One such company has found that hundreds of thousands of dollars have been saved since they started the safety incentive programs.

In one insurance group known as America Fore Companies, the operations of the safety incentive program cover all types of fleets,

For overhead maintenance — up to 14 feet

SAFETY DIRECTORS like these mobile ladder-trucks because the automatic safety control locks truck—makes it a stable work platform—with 4-way guard rail protection for operator.

OPERATORS like Safe-Lad because all tools and equipment are always handy in the base tray—and they always feel secure and comfortable.

MANAGERS like Safe-Lad because it reduces overhead maintenance costs—in some cases by as much as 50%.

For complete specifications, write—

SAFE-LAD
Manufacturing Company
1003 S. E. Morrison • Portland 14, Oregon
(Use Key # L-14 on Inquiry Card on page 73)

ranging from gas and fuel, liquefied gas, dry cargo, produce as well as activities of driver salesmen. More than 8,000 specially designed pins have been presented to the drivers each year.

In industrial accident prevention, the same insurance organization steps in once again in an advisory capacity to demonstrate to management and staff that safety benefits can be achieved by interdepartmental competition, thus making employees more safety conscious. Prizes are set up in various categories, such as interdepartmental and inter-plant.

The winning department receives personalized gifts for each employee, for example, wallets, tie clips, pen and pencil sets, money clips and cigarette lighters. One of the most popular forms of incentives toward safety is the "honor award" which utilizes the company emblem attached to each gift.* This gives the employee the proverbial pat on the back from his employer and makes the award a popular as well as useful item. In addition industry often makes use of plaques and trophies which they award to the winning plant on a group basis in addition to individual awards. It has been found that actual gifts constitute an inexpensive method of rewarding consistent effort in accident prevention because those awards are usually bought with money saved by the reduction of accidents and thus they are far less costly and represent tangible results in preventing painful tragedies.

• • •

A substantial decrease in ground accidents within the Air Force's largest command, the Air Training Command, during Fiscal Year 1955, resulted in a saving of nearly a third of a million dollars. This was recently announced by Lieutenant General Charles T. Myers, boss of the command's 42 bases and quarter million personnel.

Credit for much of the reduction, according to the General, can probably be given to the incentive award of $25,000 for the personnel of the base showing the lowest composite ground accident index. This award comes from non-appropriated funds generated from profits of the Base Exchanges, theatres and other such activities not sponsored by taxes. General Myers also announced an increase in the ground accident incentive award for the current fiscal year. In addition to the first prize at the $25,000 level a second prize of $15,000 and third prize of $10,000 will also be offered.

Winner of the monetary grant for Fiscal Year '55 was Ellington Air Force Base, Houston, Texas. Runners-up were Reese Air Force Base, Lubbock, Texas, and Lackland Air Force Base, San Antonio, Texas.

• • •

St. Regis Paper Company announces that its multiwall paper bag plant at Vancouver, B. C. has completed over four years of operation without a lost-time accident, representing 904,500 manhours of work. The plant has won seven citations for superior safety records in 1954 including the National Safety Council's Certificate of Commendation, the Canadian Pulp & Paper Association's Western Shield, the British Columbia Workmen's Compensation Board Award and its Pennant. The latter was awarded for its previous three-year record without a time-loss accident.

During the first six months of 1955, the St. Regis Printing, Publication, and Converting Paper Division with mills at Bucksport, Maine; Deferiet, New York; Kalamazoo, Michigan; and Sartell, Minnesota, achieved a 70 percent decrease in its accident frequency rate.

Each mill and plant of the company competes for the Annual St. Regis Safety Plaque and divisional plaques are also awarded in each of the five divisions. The over-all lost-time accident frequency rate for St. Regis including the Woodlands Division, during the first six months of 1955 was 10.36 percent which represents a decline of 22 percent over a comparable period of last year.

• • •

The Cowan, Tenn., Plant of Marquette Cement Manufacturing Company has been presented the National Safety Council's Award of Merit for its excellent safety record. The plant maintained an injury-free period of 1,106,805 man-hours from February 2, 1951 to July 25, 1955.

• • •

The Chemical Plants Division of Blaw-Knox has received the Award of Merit from the Atomic Energy Commission in recognition of the Division's more than 1,100,000 accident free man hours of work in a three-month period last year in the construction of a multi-million dollar facility for the AEC at Richland, Washington. Blaw-Knox has received three other safety awards from the National Safety Council during the two-year project.

• • •

The best safety record in the history of TNT manufacture in this country, according to all available Ordnance Corps information, has been set by the Kankakee Unit, Joliet (Ill.) Arsenal—3,000,000 manhours without a disabling injury. The plant, operated for the government by the Naugatuck Chemical division, United States Rubber Co., will receive an award of Honor from the National Safety Council. The record was begun in October 1954, and is continuing.

The previous record, 2,500,000 man-hours, was also held by the 2,200 employes of this plant. Paul Blunt is plant manager, and John J. Raytkwich is safety superintendent.

• • •

A record of one and a half million injury-free man hours of work during nineteen months of operation at the Lewis Machinery Division of Blaw-Knox Company, Pittsburgh, has won two safety awards for the division—one from Pennsylvania Manufacturers Association, the other from the National Safety Council.

• • •

Safety statistics compiled by Pittsburgh Plate Glass Company revealed that the month of August terminated outstanding records of

* Further information concerning the awards can be obtained upon inquiry to the Editor.

two Pittsburgh Plate manufacturing units, T. R. Donoghue, manager of safety and plant protection, announced.

The Ditzler Color Division at Detroit, Michigan, recorded 1,004 no-accident days during which employees completed 2,952,345 man-hours since November 13, 1952. A lost-time accident on August 15 ended the excellent record. Earlier this year, the Ditzler unit received the National Safety Council's "Award of Honor" and Pittsburgh Plate's "Certificate of Honor."

Mr. Donoghue also announced that the safety record of the Lake Charles, Louisiana, plant of Columbia-Southern Chemical Corporation, a wholly-owned subsidiary, ended August 10. Lake Charles employees worked 263 no-accident days during which they completed 682,157 man-hours since the last disabling injury occurred on November 19, 1954.

• • •

Chemstrand's Decatur, Alabama, plant, has received a million man hour safety plaque from its insurance carrier. The employees worked one million man hours over a period of 365 days without a disabling injury.

• • •

Postmaster General Arthur E. Summerfield has accepted a special National Safety Council citation in recognition of the contributions Postal people made to community traffic safety in 1954. In accepting the citation, Mr. Summerfield explained that the Post Office Department had one of the worst traffic accident records in the entire Federal Government until a year ago when they launched Safe Driving and Driver Training and Testing programs.

"In the last quarter of fiscal 1954, accidents involving Postal vehicles were down 11 percent and accident costs to the Department reduced 24 percent. At some installations these reductions were as much as 50 percent in the number of accidents and 75 percent in Departmental costs resulting from accidents. This year again our Postal drivers have achieved an excellent record. Costs of repairs to Postal vehicles now have been halved since the intensive safety program started."

The citation was awarded the Postal Service for: 1. The part Postal people all over the country have played in stimulating further local community safety programs; 2. Cooperation in participating in national and local safety programs; 3. The work Postal people have done to establish better working relations with local traffic authorities to integrate Postal transportation and delivery patterns with the one-way street and no-parking plans of the communities.

• • •

The Award of Merit of the National Safety Council was recently presented to the P. H. Glatfelter Co., Spring Grove, Pa. for operating a total of 1,398,580 man hours without a disabling injury. The company, manufacturer of quality paper, with an outstanding safety record in all its plants, is also in first place in the Pulp and Paper Division, Group B, for its excellent record so far this calendar year.

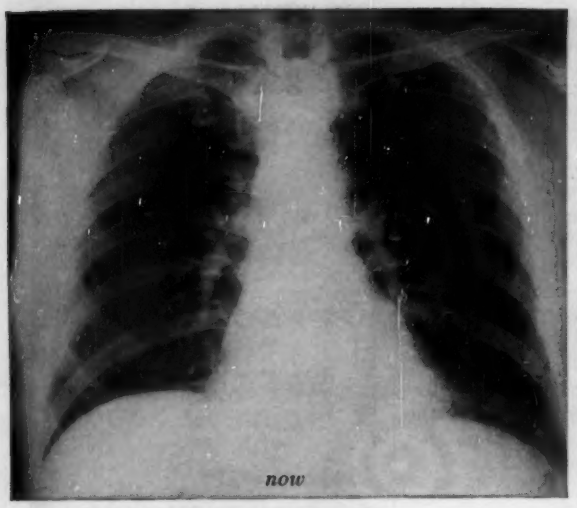
• • •

For the fourth time in five years Davison Chemical Company Division of W. R. Grace & Co., has won the "Award of Honor" of the National Safety Council. Marlin G. Geiger, president of Davison, joined with A. B. Pettit, the company's director of Industrial Health & Safety, in accepting the award from J. W. Carothers, president of the Baltimore Safety Council.

To win the honor, Davison on a company-wide basis in 1954 scored a 58 percent reduction in frequency of accidents and a 32 percent reduction in severity of accidents from "par" figures set up by the national organization, which are averages derived from previous accident records.

In addition to the national award, the Safety Council's Award of Merit went to Davison plants at Curtis Bay, Md.; Bartow, Fla.; Perry, Iowa, and Nashville, Tenn., and its Commendation Certificate to Gretna, La., and Columbus, O., plants.

Keyed to Success
COMPANY NAME
PLAY IT SAFE
Creators of the "SPIN-O-GRAM"
TERRIFIC for launching an award program.
Prices and samples on request.
SELL SAFETY
THRU INCENTIVES
Encourage teamwork with individual and departmental awards. As everyone in department or plant reach million (or ½ or ¼) accident-free man hours, present fine quality awards, personalized with your own company emblem. Make every one "HIS BROTHER'S KEEPER".
FREE DESIGN SERVICE
JUST SEND US YOUR TRADEMARK.
SAFE DRIVER AWARD
3 YEARS
America Fore INSURANCE GROUP
SAFE DRIVER AWARD
JOHN SMITH
has driven with a genuine regard for the lives and property of others and has had no accidents for one year
The Fidelity and Casualty Company of New York
FIDELITY & CASUALTY CO. of N. Y. AWARDS FOR SAFE DRIVERS
POCKET SAVERS FOR SAFETY SUGGESTIONS
SEND FOR FREE
ILLUSTRATED CASE HISTORIES
Award Incentives, Inc.
200 William St., N. Y. 38, N. Y.
Chicago • Los Angeles • San Francisco
(Use Key # L-15 on Inquiry Card on page 73)



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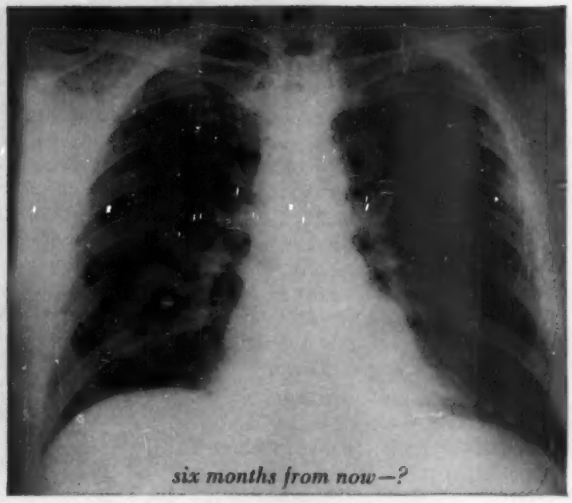

six months from now—?

TWICE A YEAR

MEN OVER 45!...Lung cancer, in men of your age, has increased so alarmingly in recent years that our doctors strongly recommend that you make a habit of having *two* chest x-rays every year: one, when you get your annual medical checkup; the other six months later.

Today, you are six times more likely to develop lung cancer than a man of your age twenty years ago. Our doctors still don't know *why* you are, but they *do* know that their chances of saving your life could be as much as ten times greater if they could only detect lung cancer "before it talks"...before you notice any symptoms whatsoever in yourself.

That's why we urge you and every man over forty-five to make semiannual chest x-rays a habit —for *life*.

To see our lifesaving film, "The Warning Shadow," call the American Cancer Society office nearest you or simply write to "Cancer" in care of your local Post Office.

American Cancer Society

industrial hygiene

The Occupational Health Dollar

Edited in cooperation with
OCCUPATIONAL HEALTH INSTITUTE
Educational affiliate of
INDUSTRIAL MEDICAL ASSOCIATION

THE SCOPE of occupational health programs practiced in industry varies from simple first-aid to highly complex activities of professional teams—doctors, nurses, safety engineers, hygienists—engaged in the solution of health problems vital to the continuation of a manufacturing process or even to the survival of a business.

The company medical service varies with the setting. It may be the principal resource of an isolated community, or it may be but a link in a great city's network of private medical care and public health facilities. In various industries, special occupational hazards and safety problems can affect greatly the complexity of the health program of the community. In companies with foreign branches, the health program must concern itself with broad factors of world health.

Every year more and more companies—large, medium and small—are establishing industrial health programs or expanding the ones they have. The reason for this is that industry has recognized a sound employee health program as another efficient management operation, as important a function as sales activities and production.

Small Plants Please Note

Every company—**no matter what its size or product**—can have effective medical services and reap the benefits that flow to all concerned, employee as well as employer. **The simple elements of a successful program will work in a shop with 10 employees or in a factory with 10,000 on the payroll.** Like all other industrial management techniques, they can be applied so that they meet the needs and problems of the individual company, well within its financial means and available facilities.

Successful preventive health programs in companies of all sizes have a common characteristic: they are as much a part of the day-to-day operations of a plant as production, sales or safety. To assure the wholehearted cooperation of employees, it is necessary that management enthusiastically support the program and make clear to them that the program's primary function is to maintain the health of the individual worker. The benefits to management are healthy employees.

The difficulties of reducing the intangibles of a health program to profit and loss figures are obvious, because no one standard is followed by companies in recording or reporting their experiences. However, the experience of thousands of companies has established the fact that in addition to increased efficiency, better employment relations and various other benefits, a health program definitely pays dividends in dollars and cents.

Days lost due to illness or accident disability are inevitably associated with disruption of production. In addition, it directly affects sales and, therefore, profits. Illness even indirectly attributable to occupational injuries or disease may also affect compensation costs. While there is an irreducible minimum number of days lost due to illness and accident, there are ways and means to cut losses to arrive at this minimum through a preventive health program. The value of an industrial health program can also be estimated in the benefits that result from early diagnosis and prevention of more serious illnesses because of early medical and surgical care. The number of days lost because of minor injuries and illness greatly outnumber days lost for serious diseases. When minor injuries are treated early, complications and lost time are kept at a minimum. It is also possible through preventive medicine to treat people with serious diseases early enough to avoid catastrophic illness.

In evaluating an industrial health program, it is essential to realize that even simple illness is the

cause of a majority of all absences and may be a contributing cause of many accidents and resulting compensation payments. Frequently, even though the disability is not severe and the employee is able to stay on the job, it causes a substantial money loss to the employer by lowering the employee's efficiency and adversely affecting production.

The experience of a packing plant with about 500 employees demonstrated a typical example of savings to management through a sound health maintenance and safety program. During operation of its program, the plant's accident frequency rate had dropped more than 86 percent. Another reported receiving a retroactive compensation credit from its insurance carrier of 22.6 percent, because of excellent accident and illness experience.

As to what "my management should invest" in the development of an employee health program, few suggestions have been found to be applicable to the individual company. It has been demonstrated by the U. S. Public Health Service that the expenditure by a company of $8.00 per man per year on a health program should yield a $12.00, or a 150 percent return per year to that company. However, reliable sources indicate an expenditure of from $18.00 to $32.00 per employee—depending upon the size of the company's work force—is necessary for a good medical program. It can readily be seen that the per capita cost for a company of several thousand employees would be far less than that of a small company for, comparatively, the same plan. It has been belabored that the good will or public relations of a company cannot be measured in dollars and cents. This philosophy might also be applied to a company's investment in employee health care. Nevertheless, the American Management Association claims that "the medical dollar produces more than any other dollar spent by industry."

At right is a replica of the "certificate of Health Maintenance" scroll, a badge of the successfully instituted industrial health program.

The standards for certification established and approved by the Industrial Medical Association are adaptable to fit companies ranging from as few as 50 employees to 25,000 or more. Those companies meeting these standards are awarded the scroll by the Occupational Health Institute.

The certification service is free, and each industrial medical unit of a multi-unit company must be evaluated individually.

To apply for a survey leading to certification, companies should communicate with the Occupational Health Institute, Inc., 6 East 39th Street, New York 16, New York. Copies of the OHI Service Bulletin, "Your Company—Why An Accredited Medical Program?", will be sent upon request.

The
OCCUPATIONAL·HEALTH·INSTITUTE
HAS · APPROVED · THE · MEDICAL · SERVICE · OF

The John Doe Company

WHICH HAS COMPLIED WITH THE STANDARD FOR MEDICAL SERVICE IN INDUSTRY AS ESTABLISHED AND APPROVED BY THE INDUSTRIAL MEDICAL ASSOCIATION

I

THIS establishment has an organized medical department with competent medical staff, including consultants. It has policy, procedures and facilities for adequate emergency dispensary and hospital needs and personnel to assure efficient care of the ill and injured.

II

MEMBERSHIP on the medical staff is restricted to doctors and/or nurses who are (a) graduates of acceptable schools of learning with degrees of Doctor of Medicine and Registered Nurse respectively, in good standing and licensed to practice in their respective states or provinces, (b) competent in the field of medicine and nursing as applied to industry, (c) worthy in character and in matters of professional ethics.

III

FACILITIES are available for the performance of competent preplacement and periodic medical examinations in keeping with existing needs of the organization.

IV

A system of accurate and complete records is maintained. Such records include, particularly, a report of injury and illness, description of physical findings, treatment, estimated period of disability, and results, as well as other information pertinent to the case or required by statute for Workmen's Compensation claims and other purposes. All medical records are regarded as confidential material filed under medical supervision and maintained only in the medical department.

V

EMPLOYEES requiring special care are referred to competent consultants.

VI

THE medical department has general supervision over the sanitation and industrial hygiene of the plant which has to do with the health and medical welfare of all employees.

This certificate is hereby granted

Chairman, Board of Trustees
Occupational Health Institute

District Counselor

Health and Safety Programs Possible ...for even The Smallest Plant

The Occupational Health Institute points out that it is possible to practically banish occupational injury and accident from industry. **Company size has no bearing on the problem—thousands of smaller companies have done so.** These companies recognize that safety is as important a function of their operations as sales and production and that a safe operation is an efficient, well planned one. They made it a prime responsibility of top management.

Accidents drop, occupational diseases are reduced and compensation insurance premiums are lowered, when such a program takes effect. These are the tangible benefits that can be measured in terms of dollars and cents. In addition, companies find that employee morale is increased, employee-employer relations benefit, and public and community relations are improved.

The chief purpose of a safety program, often overlooked, is to develop a "safety conscious" attitude both in top management and its key people. Management must accept safety on a par with responsibility for quantity and quality of production and sales. Key personnel must be impressed by the fact that they have the responsibility for carrying out safety activities and that safety is a normal and vital part of their jobs.

The better-recognized objective of a safety program to find the causes for accident and remove them—is fairly obvious. However, it's not as simple as it looks in writing. Rarely, if ever, is a single factor the cause of an accident. Behind practically every accident is a chain of factors.

Accident causes fall into two categories:

1. **Human causes:**
a. Faulty instruction
b. Poor discipline
c. Lack of concentration
d. Unsafe practices
e. Mentally unfit
f. Physically unfit

2. **Mechanical and material causes:**
a. Physical hazards
b. Poor housekeeping
c. Defective equipment
d. Unsafe building conditions
e. Improper working conditions
f. Improper planning
g. Improper dress or apparel

An analysis of the records of past accidents possibly will point out a hazardous job, condition, place or practice. In checking through records, look for the chain that led to an accident.

Following a plant inspection and an analysis of past accident records, several conditions and practices which require correction will have been seen and recorded. An operative problem will have been recognized. Control of such problems is a prime function of competent cost-conscious management.

Hazards fall into three classifications:

1. Hazards which can be eliminated immediately, such as unguarded machinery, poor housekeeping, defective tools and equipment, lighting, etc.

2. Hazards which cannot be eliminated immediately, such as unsafe machine design and improper layout of machinery and unsafe processes. While plans are made for eventual correction, control to minimize risks should be immediately set up.

3. Unsafe working methods which can be eliminated through employee training. Every employee should be thoroughly indoctrinated in his job with respect to safety.

A safety program must be designed to suit the particular needs of each plant. Programs vary widely in detail and procedures, but the elements dealing with human relationships and technical arrangements are always present in successful plans.

In setting up a safety program, it is vital that the safety work be fitted into the work-a-day routine of the company's operation. Most safety activities fit naturally into activities that are part of plant routine. Safety is not an isolated program. It is a definite part of sound operating procedures.

Step 1

The first step in carrying out the program is to set up a safety organization whose prime function is to enlist and maintain the interest and cooperation of every man and woman in the task of preventing accidents.

While the organization should fit the needs of the individual plant, the following two elements should

(Continued on page 51)

Ready . . .

BATTLE

A new instrument which measures ozone content of the atmosphere continuously by photoelectric methods goes into action at Los Angeles. Scientists checking it over hope that it will help explain what part sunshine plays in creating smog.

IN THE THICKLY POPULATED 1630 square miles of the Los Angeles Basin smog is both the current No. 1 economic problem and the chief irritant of 5,000,000 people.

It is also a fighting word, a platform for political campaigns, a gag on radio and TV—and a very serious threat indeed to the continued growth of the entire Los Angeles area.

Smog vs Air Pollution

Authorities on the subject differentiate between smog and air pollution. By smog they mean the eye-irritating, acrid substances that cause vast discomfort to humans and damage to plant life.

They point out that the Los Angeles Basin may have a high incidence of air pollution without having all the smog symptoms, despite the fact that the same critical conditions are present as when smog occurs. Thus, on a day when there is no wind, a low temperature inversion and approximately the same concentration of combustion products in the air, there may or may not be plant damage.

What is responsible for this apparent anomaly, no one yet knows. It is one of the big questions being investigated by the Air Pollution Foundation and other governmental and scientific agencies engaged in smog research. When the answer is found, the first phase in the fight to eradicate smog will be over.

Although the exact components of smog remain obscure, the authorities are clear that it results from a combination of man's actions and nature's meteorological and geographical caprices.

Man with his industries, automobiles, busses, trucks, and incinerators provides much of the raw material out of which smog presumably evolves. These are mainly hydrocarbons, combustion products, and other vapors. Nature inadvertently contributes to the problem an "upside-down atmosphere" in the Basin, a mountain barrier on three sides and low average winds off the Pacific Ocean. All of these factors reduce ventilation in the area to a minimum and make it a definite incubator for smog. However, much additional research is needed to find out if a host of other organic compounds in the atmosphere are involved, their sources, and the exact nature of their reactions.

What Is Smog?

Dr. W. L. Faith, vice-president of the Air Pollution Foundation, lists the 10 big scientific question marks that have to be answered before smog can be reduced:

1. Do certain gases in the air (hydrocarbons and nitrogen oxides)—strongly suspected of being major causes of smog—change in the presence of sunlight to produce an eye irritant? If so, are some members of the hydrocarbon family (raw gasoline contains hundreds of these) more to blame than others?
2. Does the smoke or gases from incinerators contribute to eye irritation?
3. Do industrial fumes or smoke cause or contribute to irritation of the eyes? If so, which specific gases or pollutants?
4. Do any of the gases from the sources named contribute to reduction of visibility, even though invisible as emitted?
5. What are the actual plant damaging substances in the air?
6. What are the actual eye irritants in the air?
7. Are there any compounds yet unmeasured in the air which are responsible for smog?
8. Are there any "unknowns" which up to now are not even suspect?
9. Are any temporary procedures ready to hand which can be used to control smog on a short-term basis while permanent control methods are being developed? What would be the economic consequences of adopting any such method?
10. How can the hydrocarbon nitrogen oxide content of auto exhaust be controlled?

Aim . . . Fire! . . . in the . . .

AGAINST SMOG

Up to now the precise chemical nature of smog has baffled scientific investigators. The best known theory today is that smog is the result of photo-chemical reactions involving hydrocarbons, oxides of nitrogen, and sunshine.

It is known that the presence of smog is signaled by irritation of the eyes and respiratory tract sometimes accompanied, during severe attacks, by nausea or mental depression. Beyond this, the physiological effects of smog on humans are largely unknown, despite various and conflicting claims to the contrary.

Smog definitely damages plant life. In fact, damage to vegetable crops by smog is estimated at several million dollars per year in the Los Angeles Basin.

Picturing the Los Angeles smog problem from an engineering standpoint, Dr. Lauren B. Hitchcock, president of the Air Pollution Foundation says:

"Take a box 1600 square miles in cross section, and one mile high. It holds ten billion tons of air. Put five million people in it, with a couple of million chimneys, perhaps 10,000 assorted industrial stacks, one-and-a-half million incinerators, and two-and-a-half million motor vehicles.

"Burn in these combustion devices about 60,000 tons per day of fuel oil, gasoline, gas, and rubbish, and you've got an idea of the air pollution situation in the Los Angeles basin.

"In our high school chemistry we were taught that these fuels consist largely of carbon and hydrogen, which burn to form harmless carbon dioxide and water. That this was an ideal far removed from practice, was not made clear. And it is exactly this difference between theory and fact that gives rise to man's modern urban air pollution problem."

The Los Angeles Basin is a natural atmospheric "trap" because of its geographical location and peculiar meteorological conditions. It is a low, flat, expansive valley generally surrounded on the north and east by mountains. Prevailing winds are from the west, thus blowing toward the mountains.

During much of the year a temperature inversion prevails over the Basin. A temperature inversion is a condition in which warm air is present over cooler air, acting as a lid.

Inasmuch as cold air will not rise through warm air, all air pollutants discharged into the cooler air are held near the earth, thus preventing air pollutants from escaping upward. The mountains surrounding Los Angeles Basin combine with the light winds to prevent horizontal spreading. When the inversion is at

Fluctuations of the ozone content in the atmosphere during an average Los Angeles day are charted at right in one of several checking stations spotted throughout valley area to check on content of smog.

Volunteer cry-baby at right dons plastic mask and is subjected to night air treated by artificial sunlight to test the effect of smog's eye irritation.

At research institute scientist observes the effect of oxidant concentrations on plants. Damage to crops is a serious L.A. problem.

a low level, pollutants are more concentrated and, therefore, more likely to form eye irritants and oxidants, to damage plants and to reduce visibility.

Variety of Contributors

Sources of smog in the Los Angeles Basin include a great variety of contributing materials, and it is this variety that has made it extremely difficult to point to single causes. The contributing materials are believed to contain some components of all the gases, liquids, and solids found in man's environment, natural or manufactured.

Research so far indicates that about 60,000 tons of various materials are burned each day throughout the Basin, and it is generally agreed that incomplete combustion of these materials results in over 3000 tons of air pollutants being discharged daily into the air.

The main materials burned in the Basin are natural gas, fuel oil, gasoline, and rubbish. More than 80 percent of Los Angeles' supposedly significant air pollution thus far identified is the result of incomplete combustion of these materials. It is generally agreed that the three chief contributors are motor vehicles, industry, and rubbish burning, in that order.

In the Los Angeles Basin are registered more than 2,350,000 motor vehicles of all types, which burn nearly 5,000,000 gallons of fuel per day. Of this total, varying amounts have been estimated to remain unburned or partially burned. Auto exhaust also contains oxides of nitrogen, sulfur, and carbon. Carbon dioxide is harmless in low concentrations and carbon monoxide, though toxic in auto exhaust concentrations, has never been found in our atmosphere in amounts approaching known toxic levels. Probably about half of the 3000 tons of pollutants discharged into the Basin atmosphere each day comes from the fueling and operation of motor vehicles. While evidence is not yet conclusive, there are strong indications that auto exhaust contains smog-formers.

Of course, in the final analysis the public isn't to blame for the fact that the automobiles it buys discharge these pollutants into the air. That is primarily a problem for the automobile industry, which is currently spending well over a million dollars a year to develop devices that will sharply reduce potentially noxious gases.

The public, however, can contribute measurably to reducing smog by keeping their automobile engines at best possible operating efficiency through proper adjustment of carburetors, regular cleaning of spark plugs, and prompt replacement of worn piston rings. In fact, it is reported that periodic attention to the average automobile by a mechanic can reduce automobile exhaust hydrocarbons by as much as 50 percent.

Another way in which the public can assist in smog reduction is by improving its driving habits. Each sudden release of the accelerator costs motorists money in wasted gasoline, and releases unburned or partially burned fuel into the air.

It is estimated that more than 15,000,000 pounds of combustible refuse is burned each day in the Los Angeles Basin, resulting in more than 1,000,000 pounds of unnecessary air pollutants. A large part of this is still burned in so-called backyard incinerators.

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The Foundation sees the incinerator as a definite suspect in the smog lineup of culprits. And last December it called the nation's experts here to discuss the economic, scientific, and health effects of incinerators and to determine what to do about them. Their unanimous recommendations were that under Los Angeles conditions, refuse disposal in any current type of incinerator, backyard or municipal, should be discontinued as soon as alternative disposal means can be provided. Chief among the alternatives recommended was sanitary landfill.

What Price Smog?

These are the major factors presently believed to contribute to smog. There are many more that may become more or less important as research continues and their secrets are revealed. How long this will take and how much money it will cost, no one knows.

Regarding cost, the Los Angeles area has spent several billions of dollars for highways, $750,000,000 on its water supply, $300,000,000 on its sewer system. The community ultimately may have to spend some comparable amount for clean air.

"Final solution of Los Angeles' smog problem depends on the new knowledge we gain from scientific projects now seeking answers to these questions, on continuing basic research, and—possibly above all—on fitting together and making the best use of all the facts we have as we go along," according to Dr. Faith.

Seven recent developments or adaptations of scientific instruments by various individuals and scientific agencies which are expected materially to reduce the time required to lick smog. These new instruments are:

Nitrogen Oxide Recorder—A measuring device which makes it possible to determine how much nitric oxide and at the same time nitrogen dioxide there is in smoggy air.

Hydrocarbon Recorder—A device to measure directly the amount of hydrocarbons in the atmosphere. This is important since it may provide a means of monitoring the effectiveness of controls over gasoline and exhaust vapors.

Particle Counter—This new particle counter automatically and continuously counts the number of particles in the air by size groups. Through its use it is expected that new light will be thrown on the aerosols (aerosols are a suspension of very small particles, either solids or liquids, in the air) responsible for the reduction of visibility.

The Lightweight Meteorograph—This device is for measuring temperature, pressure, and relative humidity. A very small version of this standard meteorological tool can be raised to heights of 3 thousand feet by balloons. Using it, scientists will learn a great deal more about inversion characteristics over the basin.

Visual Range Meter—This instrument has been recommended to the Air Pollution Control District for use in Los Angeles.

Oxidant Recorder—(With precursor device attached) This measuring instrument records at the same time both the amount of oxidant (gases such as ozone) in the air and the materials in the atmosphere which will form oxidant when exposed to the sun.

(Continued on the next page)

The Ozonometer—a photoelectric instrument has been developed for the automatic, around-the-clock measurement of ozone—the poisonous, smelly gas suspected of being the major cause of smog in the Los Angeles atmosphere.

"Soon we will know accurately how much poisonous ozone there is in Los Angeles' smoggy air," says Dr. Hitchcock. "After that, by making actual measurements with the new instruments in various portions of the Los Angeles Basin, we will find out where most of the concentrations of ozone occur. Armed with this information, the remaining two problems—what causes ozone and how can we get rid of it—will be well on the way to solution."

Dr. Hitchcock explains that removal of ozone from Los Angeles air might possibly do away with the eye irritating effects of smog, even though other pollutants remain.

"Ozone generally is accompanied in the atmosphere by other suspected smog formers called oxides of nitrogen, which are likewise poisonous and odorous. In the light of present knowledge on the subject, ozone might be eliminated in the air if these oxides of nitrogen and other smog suspects—organic compounds including hydrocarbons from auto exhausts and other sources—also can be removed," he says.

Ozone is a sort of blue-colored sister of oxygen. It is one of the most fascinating and dangerous gases known, roughly 100 times as poisonous as carbon monoxide, although the latter gas is much more widely known as a killer. The normal amount of ozone on the earth's surface is three or four parts per hundred million, but in smog the concentrations may be as high as fifty. Medical scientists have found that 150 parts of ozone per hundred million are dangerous to health.

Test surveys with the new ozonometer have indicated that there is (1) a relationship between oxidants rising and eye irritation increasing; (2) that eye irritating substances, just as all pollutants, increase in concentration as they travel over regions of heavy population and industry.

Other preliminary findings outlined by Dr. Hitchcock include:

1. Oxidant began to increase all over the Basin at about the same time of day, suggesting strongly that the material from which the oxidant was formed was widely distributed.
2. The peak of oxidant formation shifted one hour when human activity shifted from daylight to standard time, suggesting that the pollutants which form oxidants originate from human activity.
3. Oxidant values show a close relationship with intensity of the sun's radiation at most observing stations, but plant damage does not correlate with oxidant value, eye irritation or inversion height, and cannot be explained in terms of any of the pollutants measured in aerometric surveys.
4. The highest concentration of particulate matter was found in the downtown district of Los Angeles on November 26. This was 1,220 micrograms per cubic meter of air. Highest value in Pasadena was approximately one-half this. The average for particulates (smoke, dust, fly ash, etc.) in the central business district indicated a heavy load, which surpassed that of many cities in the nation.
5. Carbon monoxide and hydrocarbons reached their peak at a monitoring station at 8:30 A. M.
6. Sampling aloft, by blimp, showed that nitrogen oxides increase 50 to 100 percent from the surface to the base of the inversion layer, then decrease through the layer. Oxidants tend to increase to the base, then decrease more markedly than nitrogen oxides going through the layer.

A Glance at the Future

Statistical studies indicate that by 1960 the Los Angeles Basin will have a population of about 6,200,000 persons, 3,000,000 motor vehicles, many more industrial plants, and proportionately more combustible rubbish requiring disposition of one sort or another.

It is to be fervently hoped that the concerted and cooperative efforts of all agencies involved in the battle against smog will result in final and complete victory. But such victory cannot come from research or enforcement or legislation alone, or from any combination of the three. There must be, most of all, not only a strong desire on the part of every citizen, but voluntary action. If every person could put his own "house in order"—and that means his plant, his car, and his rubbish disposal—without waiting for laws and citations—without waiting for his neighbor to do it first—the problem could be rapidly reduced while the auto exhaust control and the like are being readied.

Pictures by courtesy of Air Pollution Foundation.

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Industrial Hygiene Foundation Meeting

Representatives of industrial management and the health professions will have an opportunity to get together on the solution to industrial health problems at the 20th Annual Meeting of Industrial Hygiene Foundation to be held at Mellon Institute, Pittsburgh, Pa., on November 16 and 17.

Some 700 leaders in the industries and professions from all parts of the United States are expected at technical sessions dealing with the medical, legal, engineering, chemical and toxicological phases of occupational health and will attend the main gathering at which topics of general interest and concern will be discussed. The 370 member companies of the Foundation will be represented.

Presenting the keynote address at the main session on November 17 will be Mr. A. R. Fisher, President of Johns-Manville Corporation, who will discuss the economic aspects of industrial health. Topics to be discussed at the various sessions include: graduate education for industry's professional personnel, industrial medical departments, applications of atomic energy, trends in workmen's compensation, relations of man to machines, air pollution, industrial hygiene aspects of ultrasonics.

Specific aspects of industrial health will be taken up at the technical conferences on the first day, which include panel discussions and informal sessions, with individuals from the floor directing questions to the speakers and contributing information gained through their own experiences.

A joint Medical and Chemical-Toxicological Conference is an innovation at this year's meeting. The interdependence of the two fields in any truly effective preventive medical program will be demonstrated. Two toxicologists and two industrial physicians will describe research results for detecting early functional changes caused by excessive exposures to toxic materials, and their application by the medical profession. Management personnel are invited to participate in this session also.

Dr. C. Richard Walmer, Managing Director of the Foundation, is in charge of arrangements. The meeting will be opened with a welcoming address by Dr. E. R. Weidlein, President of Mellon Institute.

Health and Safety Programs

(Continued from page 45)

always be present. The owner or manager should take and retain responsibility. Actual execution of the program may be delegated to another top-ranking executive, **but the owner or manager should continually show his interest in a safe plant. It is this element that makes active prevention programs effective** regardless of the form of organization.

A safety committee is of substantial assistance in an accident prevention organization. An executive committee composed of key personnel, foremen and supervisors, the plant doctor and nurse, should formulate

policies and consider disciplinary matters, reports and suggestions.

Through a second committee composed of working employees, many unsafe conditions and practices in the plant will be brought to light.

To develop policy and procedure, the organization should include planning control of physical hazards, planning safe operating practices, planning programs to enlist employee cooperation in safety training, safety discipline procedures, accident investigations, passing on specific problems and suggestions.

Step II

In putting the procedure into practice and following it through, employee cooperation must be enlisted. All usual channels of employer-employee communications are used in this task—letters, bulletin boards, meetings, house organs, and, most vital of all, personal contact, preferably by the individual's supervisor. Insurance companies, local safety organizations and the National Safety Council are excellent sources of materials and information that can be used for this task.

The key figure in safety work is the foreman or supervisor. He must realize clearly that safety is as much, and as important, a part of his job as production. He must work safely, teach safety and, when necessary, enforce safety.

The next element in the program is inspection of the plant. This is the chief means of uncovering hazardous conditions. In addition to continuing in-plant inspection maintained by the plant personnel, many plants have periodic inspections by outside safety consultants or engineers.

Step III

Inspection by an out-of-plant expert is a vital part of the plant inspection program. He will appraise the safety performance of the plant, determine what improvements should be made, make practical recommendations, and assist in setting up the in-plant continuing procedure. Expert safety advice may be obtained by sharing the services of an engineer with other companies in the community, all companies thus obtaining competent service at relatively small cost.

Step IV

The final step in the plant program is the investigation of accidents. They supply information regarding hazards or bad practices that have been overlooked. Careful investigation should be made of non-serious mishaps as well as of serious ones. Management should investigate the minor accident with the hope of preventing the severe one.

As the program develops, it will be found necessary to make safety rules and to insist that they be obeyed, just as it is necessary in other aspects of employer-employee relationships.

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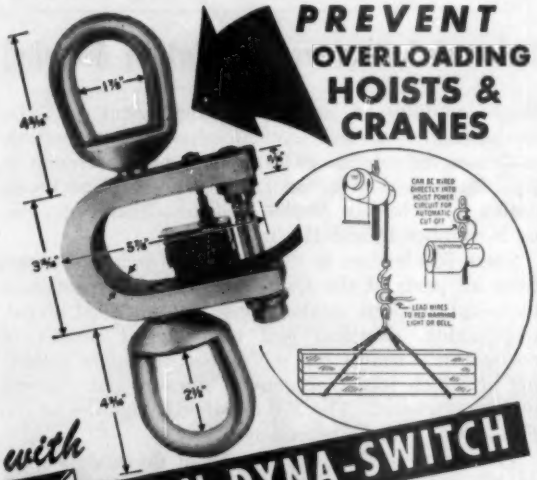

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(For details, use Key # L-24 on card on page 73)

School Shop Safety

A new pamphlet, prepared by the U. S. Department of Labor's Bureau of Labor Standards in conjunction with the Office of Education is designated to encourage safety instruction in school before the minor takes his first job in industry. It provides the vocational shop teacher with a direct approach to the student in emphasizing the importance of safe work habits beginning with his school experience in preparation for later employment.

While the pamphlet was prepared especially for use by vocational shop teachers of trade courses, it can also be used by industrial art shop teachers, by employment officials in industry, by labor organizations, and by State Labor Departments.

Suggested uses of the pamphlet by teachers are given in the flyer-insert. A limited number of free copies of the pamphlet, "School Shop—Learn Safe Work Habits Here," are available from the Bureau of Labor Standards, U. S. Dept. of Labor, Washington 25, D. C.

Sound Slidefilm Guide

More than 1,000 titles are listed in the sixth edition of the Sound Slidefilm Guide published by the DuKane Corporation, St. Charles, Ill. It reveals the widening use of the filmstrip with recorded sound as an educational tool.

The guide lists and describes individual sound slidefilms and programs for education, training, and inspirational use in business, industry and schools. Among the broad areas covered by these films, subjects of particular interest to industry include: labor and labor relations, business and economics, health and hygiene, sales and personnel training, advertising, industrial and traffic safety, and human relations.

In the past year, professional standards for sound slidefilm equipment designers and engineers have been set up and published, and the new films incorporate those standards. Source of each film is noted in the guide along with its availability, whether by rental, purchase, or free loan. Sale prices are listed for films obtainable by purchase. Also included in the booklet is an alphabetical list of titles, and a separate, complete list of sources. Priced at $1.00 per copy, it is available from the Audio Visual Division of DuKane Corporation, St. Charles, Ill.

Butch Learns Good Housekeeping

Remember "Butch"—the little guy who's learned a lot about safe practices since he became an industrial worker about five pamphlets ago? Well, he's back again, this time in the latest of the popular safety series, published by the Bureau of Labor Standards for industrial workers in all sorts of plants. Previously, you've met Butch learning the hard way about electrical gadgets, machinery, heavy lifting and whatnot. Now it's good housekeeping.

While Butch gets into all sorts of trouble, he usually learns fast. In this latest pamphlet he's pretty riled when the Boss mentions housekeeping as one of his responsibilities. As you can guess, the adventures and misadventures of Butch on the rest of the tour develop into a two way lesson in housekeeping.

Free copies, in a limited supply, are available from the Bureau of Labor Standards, U. S. Department of Labor, Washington 25, D. C. Quantities may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., at 10 cents each, with a 25 percent discount on bulk orders of 100 or more. Remittance should accompany all purchase orders which should be directed to the Superintendent of Documents.

Hotel Safety Guides

An effective plan for accident control in hotels of all sizes and types and practical methods of hotel fire prevention are the subjects of two pamphlets just published by the Accident Prevention Department of the Association of Casualty and Surety Companies.

The pamphlets present comprehensive lists of accident and fire prevention measures. In addition, they are designed to provide hotel management and personnel with flexible plans for creating and sustaining interests in fire and accident prevention.

The first pamphlet, "A Safety Guide for Hotels," includes information on methods of inspection, accident reports and records, training of new employees, first aid, organization and functions of safety committees and common hazards to be avoided. Of particular value to hotel management are the suggested inspection report forms for checking physical conditions.

Among the subjects covered in "A Fire Prevention Guide for Hotels," are means of escape in the event of fire, alarm systems, first aid fire protection, building construction, boilers and power plants, fuel storage, chimneys and incinerators, electrical hazards, gas equipment, ventilation, air conditioning, refrigeration, decorations, service shops, storage of paints and solvents, storage rooms, kitchens, laundries and housekeeping.

Both pamphlets are available for ten cents a copy from the Accident Prevention Department, Association of Casualty and Surety Companies, 60 John Street, New York 38, New York. For orders of 100 copies or more, a special rate of $6.00 per hundred will apply.

New, radio-active, automatic fire guard!

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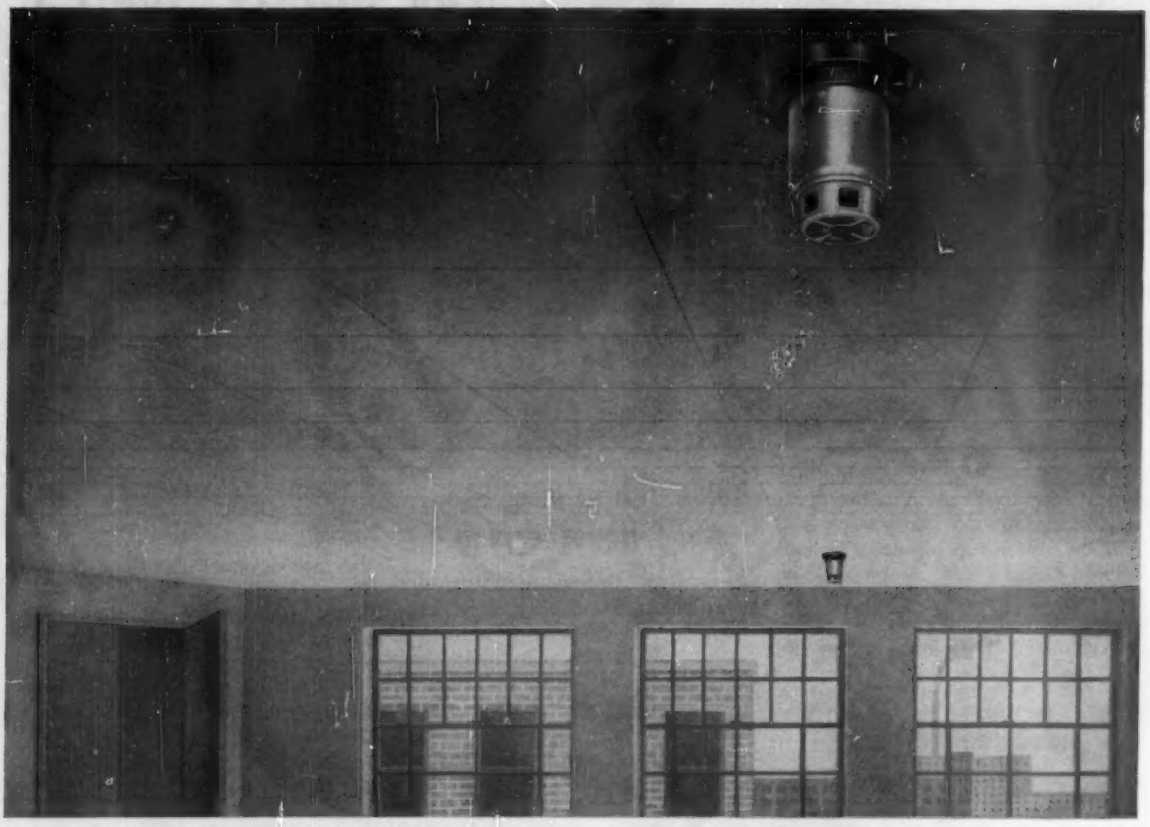

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The C-O-TWO Pre-Detector System has been subjected to extensive testing and carries Underwriters' Laboratories, Inc. listing, as well as Factory Mutual Laboratories approval. Proven pilot installations have been made in such diversified properties as a television station, an electric power company network analyzer room, a railroad signal tower, an airline flight training equipment room and the offices of an insurance company.

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(For details, use Key # L-25 on card on page 73)

Water Spray

In recent years there has been a considerable increase in the use of finely divided water, discharged from spray nozzles or automatic sprinklers, for extinguishing certain types of fires. Since water in the form of small drops appears to be very effective on many fires, this development has become of increasing importance to both the fire services and fire insurance interests.

Recently, Underwriters' Laboratories, Inc., in a report prepared for the National Board of Fire Underwriters, describes the fundamental factors involved in fire extinguishment by means of water sprays. According to the study, tests show that fire extinguishment is due primarily to smothering effects of water vapor produced by evaporation of the water drops. Cooling effects of the water supply are also important.

The laboratory-scale tests were run to determine the droplet size distribution in experimental sprays and then to determine the extinguishing effects of water sprays of known droplet size.

Many successful applications of water spray in putting out fires had been reported previously, but data on the fundamental processes involved in extinguishment and the factors which influence them were somewhat meager. In order that this method of attacking fires may be employed most advantageously and its limitations understood, a knowledge of the way in which water droplets act to put out various fires is essential.

Fire Extinguishing Theory

It is generally recognized that fire is a chemical reaction proceeding with the evolution of heat and light. The most common unwanted fires involve reactions between a substance and the oxygen of the surrounding air. Two essential requirements for the initiation and maintenance of ordinary combustion are a fuel and an adequate supply of oxygen. The combustion processes will cease and the fire be extinguished if either reactant is no longer present in sufficient proportions.

The extinguishment of fire by removing the fuel is not always practical, although in some circumstances, such as closing a valve on a burning gas line, it may be the simplest method.

Curtailment or depletion of the oxygen supply is the basis of many fire fighting techniques commonly referred to as smothering or blanketing a fire. In order to put out a fire, elimination of all oxygen is generally not necessary; flaming combustion of most common materials can no longer continue after oxygen is reduced to 12 to 15 percent by volume.

Fires can be extinguished by diluting the oxygen content of the surrounding air with an inert gas or vapor. Carbon dioxide and nitrogen are commonly used for this purpose as are the various vaporizing extinguishing agents.

Similarly, it is well known that water vapor or steam may be used under appropriate conditions to dilute the oxygen in the atmosphere. In extinguishing fires by smothering, sprays of finely divided water as a source of water vapor have certain advantages.

In addition to fuel and oxygen, heat is necessary to start and maintain a fire. A combustible substance must be heated to its ignition temperature if combustion reactions are to proceed. Once started, the reaction is usually maintained by the heat liberated by combustion. If the seat of a fire can be cooled to temperatures below the ignition temperature, the fire will be extinguished. Sprays of water droplets apparently have certain advantages as a cooling medium for fire extinguishment.

Nineteen different spray nozzles or combinations of nozzles were tested on a variety of fires during the investigation. Fuels used included wood, gasoline, kerosene, and ethyl alcohol.

According to the NBFU report, sprays of finely divided water have an extinguishing effect primarily by diluting the air supply with vapor resulting from evaporation of water droplets in the heated area surrounding the fire. The cooling effects of the water may also be important factors in extinguishment in many cases. In order to obtain extinguishment, the water droplets comprising the spray must be relatively small, and the amount of water applied must be adequate in relation to the specific fire.

The marked increase in water surface per gallon where water is dispersed as droplets in a spray is an advantage since the rate of

Seasonal Fire Rise

Estimated fire losses in the United States during August amounted to $71,103,000, according to the National Board of Fire Underwriters, this loss represents a decrease of 9.0 percent from losses of $78,163,000 reported for August, 1954, and an increase of 15.4 percent over losses of $61,614,000 for last July (1955).

Losses for the first eight months of 1955 now total $602,474,000 a decrease of 0.2 percent from the first eight months of 1954, when they amounted to $603,685,000. These estimated losses include an allowance for uninsured and unreported losses.

evaporation of the water and the cooling effects are directly proportional to the surface area, other factors being constant.

There is a lower limit to the size of the droplets which are of practical use in fighting fire, however, since the droplets must be large enough to travel from the source of the spray to the heated area surrounding the fire, and to arrive there with sufficient energy to overcome the currents of hot and turbulent gases moving upwards and away from the fire.

Droplets too large to evaporate completely on passing through the zone of combustion and its immediate surroundings may contribute to extinguishment in some cases by cooling the unburned fuel. Even though no extinguishment occurs, the application of water spray may control the burning to some extent.

In tests where experimental water sprays having known droplet size distribution were applied to fires, extinguishment occurred if the droplet size was within certain limits and the total water reaching the test fire exceeded a minimum volume in relation to the drop size. The results of these tests suggest that the optimum average volume diameter of the water droplets for extinguishment is of the order of 300 microns (0.012 inch).

The tests also showed that kerosene and ethyl alcohol fires appear to be more readily extinguished by water spray than are gasoline fires.

In tests with water sprays applied to gasoline fires, it appeared that extinguishment was due primarily to dilution of the oxygen supply with water vapor. The absorption of heat during evaporation of the droplets may also contribute to extinguishment, particularly when it occurs in or near the zone of burning.

Extinguishment by cooling the fuel with water spray is not possible in the case of gasoline fires since the fire point and flash point of gasoline are well below the freezing point of water.

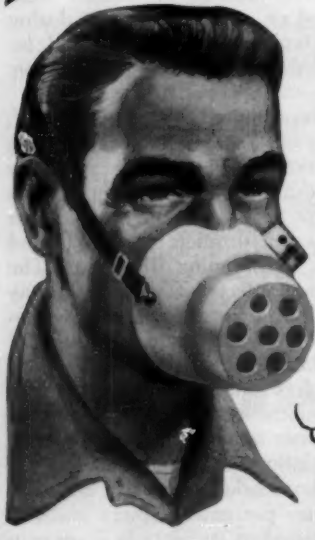
Copies of this report, "The Mechanism of Extinguishment of Fire by Finely Divided Water," may be obtained from the Research Division of the National Board of Fire Underwriters, 85 John Street, New York 38, N. Y.

Truck Fire Protection

A revised fire safety standard applying to truck fire protection has been published by the National Fire Protection Association. Designated NFPA Fire Safety Standard No. 512, "Truck Fire Protection—Recommended Good Practices," it was officially adopted in revised form by the NFPA at its annual meeting. The principal revision applied to the installation of cargo space heating equipment. Section C of the standard now details a series of safeguards recommended to minimize the fire hazards of such installations. The standard is now available in pamphlet form from the NFPA, 60 Batterymarch St., Boston, and is also included in the 1955 edition of the National Fire Codes.

Your insides feel like a SAND STORM ?

YOU NEED A
DUPOR AUTOMATIC
Water-Cooled Respirator

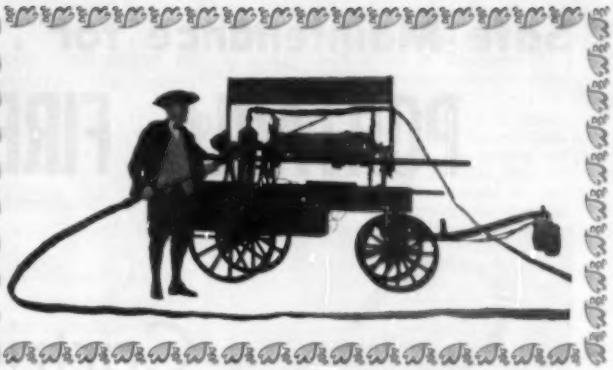


Sponge filter saturated in cool, clear water provides moist air for comfortable breathing. Ideal protection against dust, fumes, smoke, paint spray. Full panorama visibility. Can be worn with goggles or glasses. Work refreshed, order a water-conditioned respirator today! Sample, $2.00 postpaid.

H. S. COVER, SOUTH BEND, IND.

"Respirators for Industry since 1894"

(For details, use Key # L-26 on card on page 73)



Historic fire truck, first used before Revolutionary War, is demonstrated by 94-year-old volunteer fire-fighter of the 90's.

v and Old

et at Fire School

HUNDRED and fifty ersey firemen—represent- county and every major y in the state—met last Sea Girt, for the New e Safety Council's annual ge.

ear, the 3-day work-and- ion gives the state's fire- opportunity to test new t, and learn and practice advances in skilled fire- A spirited pooling of is also an essential part eekend, and fire and its is the main topic of and conversation, from rrival until Sunday de-

ivately Supported

ts 1947 inception, more 0 New Jersey firefighters nded sessions of the Fire which is an active division ate Safety Council. The ge and all other activities fety Council are totally by contributions from y industry, commerce and The Safety Council is a ganization, and is the only supported and operated the United States. Its are not confined to fire- lone, but include accident n in the home, school, church, farm, industrial plant and on the highway.

That the job has been well done and bettered each year is exemplified by the fact that each year the New Jersey death accident rate is lowered. In 1953, it was the nation's lowest, and last year the second lowest.

Courses Cover Wide Range

Firemen attending this year's Fire College participated in spectacular pit-fires, net rescues, burning houses, and heard a wide variety of lectures by fire authorities. Courses ranged from "flammable liquid fires" to "pump operation." The 350 fully-uniformed firemen and numbers of resplendent red engines and other pieces of equipment made a remarkable panorama.

Visiting the Fire College for the weekend was spry, 94-year-old Walter Godfrey of East Orange, New Jersey, who told fascinated younger firemen "how it was done in the old days." He has been a volunteer fireman since the turn of the century. The famed pre-Revolutionary firetruck from Crosswicks, New Jersey, was at the school, and provided an interesting contrast with the giant machines of today.

Pictures by courtesy of the New Jersey State Safety Council.

Man leaps into net held by "collegiate" firemen practicing fire rescue techniques.

Classroom instruction features visual aids and newest firefighting devices and ideas.

Some of the 350 firemen at the Fire College watch their classmates put out a fire.

Safe Maintenance for . . .

PORTABLE FIRE EXTINGUISHERS

Dry Chemical Cartridge—

Hand—Cartridge—Fyr-Fyter Co.

Hand—Cartridge—Pyrene C-O-Two

Hand—Cartridge—Ansul Chemical Co.

Hand—Cartridge—Walter Kidde & Co., Inc.

Hand—Cartridge—General Detroit Corp.
—General Pacific Corp.

Inspection and Maintenance

Extinguishers shall be examined at regular intervals not exceeding six months to determine if:

(a) Seal wires have been severed or the extinguishers otherwise tampered with.

(b) The orifice of the discharge nozzle is free of foreign material.

(c) The extinguisher shows evidence of mechanical damage or distortion to the shell.

Extinguishers shall be examined at least once a year to determine if:

(a) The weight of the carbon dioxide pressure cartridge meets the defined weight limits established by the manufacturer. If not, the cartridge shall be replaced or recharged.

(b) The carbon dioxide gas passages and dry chemical passages are clear. The manufacturer's instructions shall be followed.

(c) The dry chemical has free flowing qualities, and that the weight of the dry chemical in the extinguisher is neither above nor below the weight prescribed by the manufacturer.

(d) Nozzle and cartridge operating mechanism are free operating. Follow manufacturer's recommendations for inspection and maintenance.

(e) Hose and sealing gaskets have not been damaged. Extinguishers or parts which are not in good condition shall be replaced.

Extinguishers shall be recharged immediately after use.

Recharging

Carefully follow the manufacturer's directions on the instruction name plate.

Release the pressure after use. This action clears the hose of dry chemical as well as relieves the pressure.

Fire Protection Series
next article in December

PART III

This is the last of 3 installments of the *"Safety Code for Inspecting, Recharging and Maintaining Portable Fire Extinguishers"* prepared by and reprinted through the courtesy of the Fire Equipment Manufacturers' Association, Inc. The first two installments appeared in September and October.

Scope and Purpose

The scope and purpose of this safety code are intended to insure proper inspecting, recharging and maintaining of portable fire extinguishers.

Application

This safety code shall apply to all types of portable fire extinguishers.

Definitions

Where the word "shall" is used, that provision is intended to be mandatory.

Where the word "should" is used, that provision is intended to be advisory or recommended good practice.

Hand Type -Stored Pressure

Any dry chemical remaining in the shell after depressurization shall be inspected, after which the extinguisher shall be refilled to the rated capacity specified by the manufacturer. Only dry chemical furnished by the manufacturer shall be used for refilling.

Replace fully charged cartridge in accordance with the instructions furnished by the manufacturer.

Recharging work shall be done under capable supervision, and after installation of wire and lead seal, recharge date shall be recorded on a card which shall be attached to the extinguisher.

Stored Pressure Inspection and Maintenance

Extinguishers shall be examined at regular intervals not exceeding six months to determine if:

(a) Seal wires have been severed or the extinguishers otherwise tampered with.

(b) Pressure meets the prescribed limits.

(c) The orifice of the discharge nozzle is free of foreign material.

(d) The extinguisher shows evidence of mechanical damage or distortion.

(e) Extinguisher has the proper charge of dry chemical (this may be determined by weighing the extinguisher).

Extinguishers shall be recharged immediately after use.

Recharging

Carefully follow the manufacturer's instructions.

Release the pressure after use. This action clears the hose of dry chemical as well as relieves the pressure.

Only dry chemical furnished by the manufacturer shall be used for refilling.

At Right: Hand—Stored Pressure—American La-France Corp.

Below: Hand—Stored Pressure—Fyr-Fighter Co.

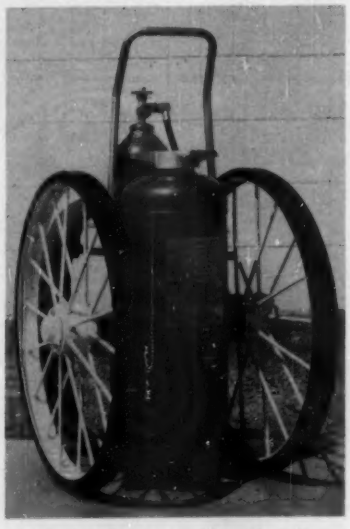
Hand—Stored Pressure—Walter Kidde & Co., Inc.

Hand—Stored Pressure—Stop-Fire, Inc.

Dry Chemical Type

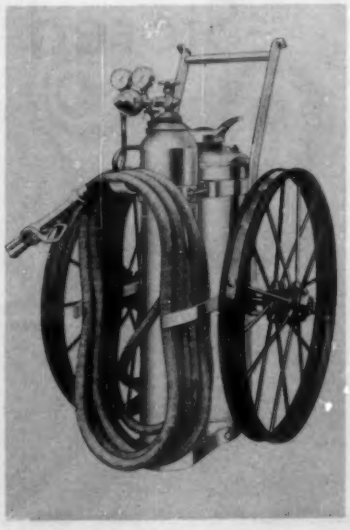
Wheeled Type—Pyrene C-O-Two

Wheeled Type—Walter Kidde & Co., Inc.



Wheeled Type—Ansul Chemical Co.

Wheeled Type—General Detroit Corp.—General Pacific Corp.



Wheeled Type—American La-France Corp.

Hand-Stored Pressure
(Continued)

Pressurize extinguisher as specified by the manufacturer.

Recharging work shall be done under capable supervision, and after installation of wire and lead seal, recharge date shall be recorded on a card which shall be attached to the extinguisher.

-Wheeled

Inspection and Maintenance

Extinguishers shall be examined at regular intervals to determine if:

(a) The wire and lead seals have been broken.

(b) The discharge nozzle is in the closed position and not blocked with foreign material.

(c) The extinguisher and hose are free of mechanical damage.

Extinguishers shall be examined annually to determine if:

(a) The nitrogen pressurizing cylinder is properly charged. This may be read directly on the valve gauge on some models or by following manufacturer's instructions on others.

(b) Hose is clear of dry chemical by following manufacturer's detailed instructions.

(c) The nozzle is free operating and undamaged.

(d) The hose coupling and nozzle connectors are tight.

(e) The extinguisher and hose are free of mechanical damage or corrosion.

Extinguishers shall be recharged immediately after use.

Recharging

Carefully follow the manufacturer's instructions.

Release the pressure in extinguisher.

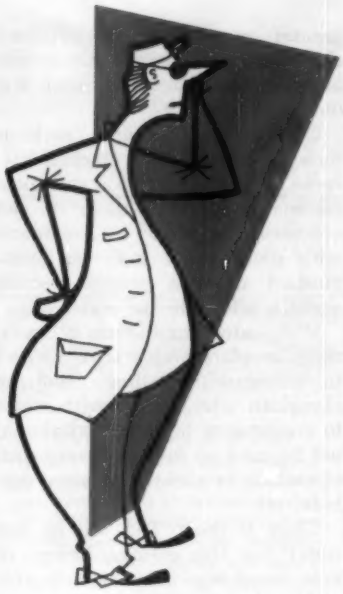
Only dry chemical furnished by the manufacturer shall be used for refilling.

Recharge nitrogen cylinder if pressure is below recommended minimum.

Turn valves to proper position.

Recharging work shall be done under capable supervision, and after installation of wire and lead seal, recharge date shall be recorded on a card which shall be attached to the extinguisher.

Learning..... the hard way



LET'S GET TOGETHER . . .

A fire which caused more than 2 and a half million dollars damage could have been confined to a small area of a plant roof and ultimate damage would have been slight if . . . the automatic sprinklers had not been shut off for 10 minutes during the early stages of the fire!

The interior fire had apparently been extinguished by a couple of sprinklers. Unaware that employees on the roof had not stopped the fire in the insulated siding, the men inside the plant shut off the sprinkler valves. No one was instructed to stand by at the two shut sprinkler valves. The fire quickly rekindled inside the building, and in the absence of water, sprinklers fused progressively. About ten minutes elapsed before the valves were reopened. The Public Fire Department was notified 30 minutes after the fire began, but could not bring the renewed flames under control for four hours.

Coordination between fire fighters inside the building and on the roof was very poor. Apparently, the team had not been instructed how to keep in touch during the emergency of the fire. Management learned the hard way.

"PROSAIC" DEFINED . . .

According to the dictionary, the word "prosaic" means common place, dull, ordinary, etc. In accident terms it means the kind that happens all the time. It is the kind of accident that is most dangerous because, while it is deadly, it is often ignored.

For example, a workman using a portable drill was killed recently when he failed to attach a ground clip and received the full voltage through his hands from a short circuit in the drill housing. This is a common type of accident which nearly everyone understands but too infrequently takes the proper precautions to guard against.

The only unusual feature about this accident is that it occurred in a chemical plant where there were many special and unusual hazards, both mechanical and chemical. The "serious" dangers had all been avoided and experience in accidents had been particularly good until this workman failed to attach the ground clip to his portable tool. The commonplace or "prosaic" had struck again!

LAVA FLOW

Five men were working in a small room installing a floor covering material when, possibly because of the congestion of too many men in a small place, a five gallon can of mastic cement was overturned. That was the last thing any of the men remembered until they recovered consciousness in the hospital. Prompt rescue work by the plant safety engineer and first aid room attendants undoubtedly saved all the lives.

The room in which the men had been working was very poorly ventilated. They were using a solvent with a neoprene base. When the can overturned, the soup-like mastic spread over a large area greatly increasing its evaporating surface. The solvent was a flammable liquid and very toxic. Inhaling its vapors causes progressive depressant action upon the nervous system. It has a narcotic action, affects bone marrow and is a pronounced irritant to mucous surfaces.

The chief cause of this accident was overcrowding . . . trying to put five men with a can of dangerous solvent in a small, poorly ventilated room and expecting them to move around and work is inviting trouble. Employees exposed to high concentrations of solvents such as this one should wear respirators, chemical type goggles and protective clothing to avoid skin contact. Always the area should be adequately ventilated.

Use of Wetting Agents

Water has been accepted for many years as the most practical fire fighting agent because of its almost universal availability, its great heat absorption capacity and because it is a liquid.

Certain chemicals, known as "wetting agents" have been developed which, when added to plain water, result in breaking down the surface tension of the water thus making it a so-called "wetter" liquid, known as "wet water," which penetrates into absorbent objects or materials and spreads over a surface more readily than plain water.

The increasing use of wetting agents in fire fighting has become pronounced in recent years, and gives indication of becoming a permanent and important factor in the field of fire control, according to a revised bulletin issued by the National Board of Fire Underwriters. Experience has indicated that the addition of a wetting agent to plain water, when properly applied, will increase the extinguishing efficiency of that water with respect to quantity used as well as time saved. The value of such a factor may become of considerable importance, especially in rural areas where the amount of water available for fire fighting is often inadequate. In other cases, such as forest fires, the increased efficiency becomes an important consideration since most of the water must be transported manually in portable equipment.

The principal value of water in extinguishing a fire is its cooling effect. Cooling is obtained largely by absorbing heat from the burning material, and the major part of this takes place when the liquid is turned into steam or vapor. The mass of water that actually contacts the burning material is what really counts, and wetness usually increases this area of contact, and, consequently, the rate of heat transfer. Quantity of water and ability to deliver it to the seat of the fire are two main factors in combating any major fire.

The bulletin goes on to warn that the lowering of the surface tension of the water may result in a broken stream, even with a smooth bore nozzle. However, in general wet water can be effectively discharged and directed by most types of standard fire-fighting equipment originally designed for use with plain water. The degree of efficiency obtained will depend on utilizing the most efficient application methods, techniques and devices for the hazard involved.

Applications

For the small fire, or the fire which smolders and bores within a quantity of combustible material, or fires where outer charred layers of material may reduce the penetration of water, the use of wet water will prove advantageous. It is of much value in brush or grass fires, especially, where there is an accumulation of duff.

Wet water, especially in connection with spray or fog nozzles, may, under proper handling, materially reduce water damage; this applies particularly to an interior fire of such a character that it can be attacked with the relatively short reach available in fog streams. The greater penetrating (absorption) characteristic of wet water means less run-off onto floors and less damage to contents.

Certain types of fires, such as those in baled cotton, stacked hay, some rubber compounds and some flammable liquids, which do not ordinarily respond to treatment with plain water may be extinguished when a proper wetting agent is added to the water.

Wet water has the same limitations as plain water with respect to extinguishing fires involving chemicals which react with water to create new hazards and should not be used on fires involving such chemicals as sodium, calcium carbide, etc.

Class B fires: The use of wet water for the extinguishment of fires involving flammable liquids and greases is limited to those materials not soluble in water, such as petroleum products. On water soluble materials of the alcohol type, some control may be realized, but extinguishment is questionable.

Class C fires: Wet water solutions have the same limitations as plain water in fighting fires involving electrical equipment, so far as safety to fire fighting personnel is concerned. Application as a straight stream is not recommended, and may be dangerous to personnel. Spray or fog application can be employed with usual caution.

Wet water, due to its penetrating characteristics, may have harmful effects on electrical equipment involving use of fabric-covered wire in their assemblies, such as motors, transformers, etc. Electrical equipment of this nature should be thoroughly flushed and cleaned after exposure to wet water solutions and before placing in service again. Use on fires involving grouped electrical cables is not recommended.

A number of wetting agents are manufactured and available for use in fire-fighting. They are organic compounds, not all of the same formulation, and may require varying concentrations for use.

A Standard for Wetting Agents, N.F.P.A. No. 18, is published by the National Fire Protection Association, 60 Batterymarch Street, Boston 10, Mass. at 35 cents a copy.

Fire Literature

(Continued on page 66)

FOR SAFETY'S SAKE . . .

DAV-SON FLASHING SAFETY DIRECTOR

With Amazing Changeable Letter Slide Out Panel

Bright traffic light red, green spots flash "SAFETY FIRST." Color, motion, light bring eyes directly to message. Only DAV-SON has changeable letter design with removable panel for quick changes, peak attention. 98 red 3½" and 250 black 1⅞" acetate letters in compartment box incl. Size 18½x29x6. Complete with lamp and U.L. Cord. **$39.75**

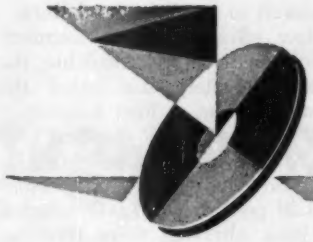
Insist on genuine self-sealing cork back bulletin boards—hardwood frame. Sizes 12x18 and larger. With or without glass doors. **$4.15** up. Also with metal frames for inside or outside use.

A Dav-Son board for every purpose. Over 100 different sizes and styles to choose from. *Dealer Inquiries Invited.*

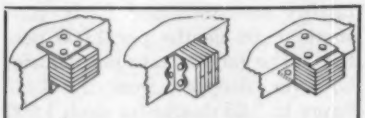
If your dealer doesn't have the Dav-Son board you need write direct.

A. C. DAVENPORT & SON, INC., Dept. SMP
311 N. DESPLAINES STREET • CHICAGO 6, ILLINOIS

(For details, use Key # L-27 on card on page 73)



transportation safety



A B C

NEW TRUCK BUMPER

Rubber-coated fabric truck bumpers, capable of being mounted anywhere on a truck body to prevent damage to trucks, buildings or loads, are being manufactured by Bumpers, Inc. The new bumpers can reduce or eliminate truck maintenance and truck down-time due to body damage sustained in colliding with loading docks.

They act as a cushion taking the impact and absorbing it saving the truck body and keeping the load from being damaged. Truckers and warehousemen assert that much of the claims resulting from load damage are traceable to truck-dock impact rather than through actual transportation. Construction of the bumpers which are made with a new, specially developed rubber-coated fabric, allows for reversing the fabric so their life can be doubled. The truck bumpers are available in three designs. Style "A" is specifically designed for truck bed platforms and I.C.C. frames. Those designated as Style "B" is for truck bed platform corners, while Style "C" is used on I.C.C. frames.

For details, use Key # TS-20 on Inquiry Card on page 73.

S-D Day

Safe Driving Day has been announced for December 1 by the President's Committee for Traffic Safety. The objective of S-D Day, which includes an intensive ten-day advance and ten-day follow-up campaign, is to demonstrate that traffic accidents can be reduced materially when all drivers and pedestrians accept individual responsibility for accident prevention.

Through their active support, business and industry can help make the S-D Day campaign a success, cut absenteeism, and render a public service to the community.

Driver Education Awards

Ten states have been selected to receive top awards for the extent and quality of their driver education programs conducted during the 1954–55 school year. The selections were made by 12 educational and traffic safety leaders comprising the board of judges of the Eighth Annual National High School Driver Education Award Program.

After examining reports from all 48 states and the District of Columbia, the judges selected Minnesota and Massachusetts to receive top-ranking Awards of Excellence. Awards of Honor were earned by California, Delaware, New York, Oklahoma and Vermont, while three states, Arizona, New Jersey and Pennsylvania, qualified for Awards of Merit.

In addition, special Honorable Mention Awards were authorized for the states of Connecticut, Kansas, New Mexico and Ohio. The judges also instructed that Special Progress Awards be given to the public schools in Colorado, Mississippi, Montana and Washington and that Special Citations for Driver Education Attainment be given to the private and parochial schools in Delaware, New Hampshire, North Dakota, Oklahoma and Vermont.

Thomas N. Boate, manager of the Accident Prevention Department of the Association of Casualty and Surety Companies, which sponsors the officially authorized program, said that typical criteria used in evaluating the state programs were percentage of eligible students enrolled in driver courses, number of hours of behind-the-wheel practice driving and percentage of high schools in which driver education was taught.

Mr. Boate stated that, "after several years of leveling off, states this year reported a significant increase in their driver education programs. It is to be hoped that this indicates a trend toward further expansion of the nationwide program. During the 1954–55 school year 9,968, or 50 percent of the public high schools in the nation, offered driver education courses and enrolled 994,212 students, or 62 percent of the total potential enrollment."

Safety Patrols

In a move towards closer Army-Community cooperation in promoting highway traffic safety the First Army has established Motorized Safety Patrols at its three major installations of the eight-state First Army area, Lt. General Thomas W. Herren, First Army Commander, has announced.

Distinctively marked and painted light sedans, operated by military police, are to be assigned to Fort Dix, N. J., Fort Devens, Mass., and Camp Drum, N. Y. The Safety Patrol cars will have radio communication, highway warning kits, fire extinguishers and first aid equipment and electric warning blinkers. These patrols will be used in liaison and coordination with civil law enforcement and safety agencies.

They will not normally be used to apprehend traffic safety violators, but will be assigned to problem areas determined by each installation. They will be available for assistance and first aid in accidents occurring on their "beats" but their chief function will be to supervise Army motor vehicle traffic, and warn operators of such vehicles of unsafe driving practices.

Other features of the First Army's motor vehicle safety program include: intensive training and testing of all drivers of military

vehicles and constant check on condition of vehicles; use of dramatic visual displays on military installations, such as exhibits of badly wrecked vehicles to impress on drivers the need for safe driving; control of passes to military personnel with a view toward restricting distances traveled and late night driving; indoctrination of all personnel by means of posters, slogans, repeated reminders in post publications and at training sessions.

First Army's highway safety record for the first six months of 1955 shows a 50 percent decrease in traffic fatalities, a 29 percent decrease in traffic accidents, and a 6 percent decrease in injuries to military personnel involved in such accidents, as compared with the same period last year.

Driver Pre-Education

Riding herd on some 20,000 vehicles registered at Fort Benning is a complicated task, but officials have come up with a fast pony to help in the corraling. It is advance driver education.

The program operates much as traffic education systems used by major cities throughout the nation. At The Infantry Center, when a person, who owns a vehicle registered at the Provost Marshal's Section, is guilty of a traffic violation, he is designated to attend a 10-hour education course. Rank is of no question. At these classes, the driver receives instruction which is based on the theory that drivers owe definite responsibilities to society in problems concerning traffic safety.

Establishment of the program two years ago was an immediate step in the right direction, according to Norman M. Evans, Infantry Center safety director, whose office supplies the school with training literature and latest methods for furthering the effectiveness of the instruction.

Since inauguration of the school, approximately 2,500 students have graduated. This means they have completed 10 hours of training and instruction with a favorable passing mark of 70 or above. The course requires four two and one-half hour sessions to complete.

While at the school, attended on off-duty time, students get a lesson in good traffic sense. Training includes showing of safety films, reaction tests, a course in good sportsmanship while driving, and most important, a study in relationship between attitude and accidents. Research has turned up a theory that people drive as they live. The person who is well disciplined, courteous and thoughtful tends to be that kind of individual when he or she is driving.

The Fort Benning school, proceeding along this line, attempts to alter somewhat, unhealthy attitudes of men who obviously do not have the proper, and safe, mental approach to good driving habits.

How effective is the training? According to figures available, the school definitely has aided the safety program at Fort Benning.

Beginning in 1947, the first year records were maintained, the fatality rate was .64 per 1,000 persons or 1.29 persons per 1,000 vehicles. In 1954, although three times as many vehicles were registered, the fatality rate remained fairly constant at .66 deaths per 1,000 persons. The fatality rate per vehicle, however, dropped from the 1947 figure to 1.05 deaths for each 1,000 vehicles.

That the program has strengthened the over-all safety program at Fort Benning is undeniable. The program's instructors believe the value of the school will increase in the future because more and more drivers are voluntarily attending the course. To safety officials, this is the most favorable of signs.

"Generally when a person is involved in an accident," safety leaders emphasized, "driver education will help to prevent another by the same person. However, advance driver education could possibly prevent the original accident."

Safety Belt Progress

Impetus to the increasing use of automobile safety belts has been given by the declarations and announced plans of a variety of organizations. At least two major automobile manufacturers will make safety belts available as dealer-installed optional equipment in 1956.

The American College of Surgeons recently passed a resolution addressed to the auto makers stating that "competent studies make it appear that a large proportion of deaths and injuries could be avoided by the installation of passenger-stabilizing devices such as safety belts."

Added support for the use of safety belts has also come from a number of prominent safety organization. A bill pending in the U. S. Senate would require all new cars to be equipped with seat belts. The State of Illinois has passed a law providing that no car can be registered in that state after July 1, 1956, unless it is equipped for the installation of seat belts.

How Do You Look at an Accident?

These problems test your ability to judge accident responsibility based on modern defensive driving techniques. They have been devised by Donald S. Buck, safety director, U. S. Army Transportation Corps. Assume that each report is based on a true accident; that each driver's statement is true and complete as given. Decide in each case whether the driver caused the accident or was victim. Remember that you are not deciding who is at fault.

Case No. 11—Driver's Statement

"I was driving along on a highway, at 25 mph, in the outskirts of the city, when this child darted out in the street after a ball. I hit the brakes and stood on the horn, but the poor kid dived back right into the side of my car as I went by. The police released me, and blamed the child for the accident. You sure can't figure what a kid will do."

Case No. 12—Driver's Statement

"I'm driving along on a main street of the city, at 20 mph. Not much traffic. I am in the right lane, next to the parking lane. There is parallel parking along the curb. Suddenly this guy in a parked car opened his door just as I came along. I swerved and blew my horn, but the back of my vehicle hit his door and tore it off."

(Answers on page 78)

TRANSPORTING

SAFELY

THE widespread damage resulting from the explosion of munitions and similar cargo being transported by truck in recent years has caused the carriers of explosives to have the highest average property damage per accident of any special cargo group.

In one explosion involving an ammunition truck in a rural area of Nebraska the tremors were reported 20 miles away. The driver unhitched the cab of the truck after a trailer tire caught fire and drove to a safe location. When the truck blew up, a crater fifteen feet deep was blasted out of the road.

In another accident which occurred in West Virginia a fire in the fuel tank of a truck caused the explosion of 15 tons of dynamite being carried on the truck. The driver discovered the fire while the vehicle was in motion. He attempted unsuccessfully to warn all the nearby residents but the blast wrecked several homes within a radius of 500 feet and killed one occupant.

Rules and regulations to prevent accidents of these types have been established and are being enforced by the Interstate Commerce Commission, U. S. Coast Guard, and Department of Defense. There are also in effect many state and local laws which regulate the transportation of explosives. Much of this legislation is based on the Fire Prevention Code recommended by the National Board of Fire Underwriters. In general the regulations cover the following categories:

Drivers – physical examinations, maximum on-duty time, maximum driving time, instructions.
Equipment–brakes, steering mechanism, tires, horn, lights, windshield wiper, rear view mirror, coupling device, fire extinguishers.
Loading Practices.
Fueling Practices.
Railroad Crossings.
Emergency Signals.
Signs and Placards.
Inspection Reports.

Specific information concerning these items can be obtained from the references listed at the end of this article.

Check Tires

The possibility of fire in tires is remote if they are properly matched and inflated and if the driver checks them every 50 miles. Potential causes of tire fires include broken rim flanges, oil deposits on tires, rubbing of dual wheels when soft, bleeding of tires and excessive braking. Every tire which becomes flat or unusually hot or which starts smoking should be removed immediately. When a tire does catch fire, the unit should be stopped in a safe location and the fire attacked with short bursts from the extinguisher. Help in giving the warning should be obtained from other people as quickly as possible.

Watch for Reflash

It is necessary to remove the wheel with the burned tire as soon as the flames are controlled. The extinguisher should be kept available to fight any reflash of the fire. Fires have been known to reflash an hour after the flames were first extinguished. Sand, dirt or asbestos blankets can be used to smother the flames if the contents of the extinguisher are exhausted. Where it is available in quantity, water is always the best extinguishing agent for a tire fire.

Use Proper Gear

Similar instructions are applicable to brake drum fires. The maintenance of proper slack adjustment and wheel bearing adjustment and the use of proper gear to check speed of vehicles will prevent these fires from originating.

The following publications contain further information on the general subject of transportation of explosives and munitions:

1. "Interstate Commerce Commission Safety Regulations Revised," Parts 190 through 196, U. S. Govt. Printing Office, Washington 25, D. C.

2. "Transportation of Explosives and Other Dangerous Articles by Motor Vehicle"—Part 197 Interstate Commerce Commission Safety Regulations, U. S. Govt. Printing Office, Washington 25, D. C.

3. Dangerous Articles Tariff No. 9 Interstate Commerce Commission Regulation, Issued by H. A. Campbell, Agent, 30 Vesey Street, N. Y. 7, N. Y.

4. Fire Prevention Code, recommended by the National Board of Fire Underwriters, 85 John Street, New York 38, N. Y.

5. "Rules, Regulations, General Information for the Safe Transportation of Munitions," Munitions Carriers Conference, 1424 Sixteenth St., N.W., Washington 6, D. C.

6. "Rules for the Safe-Efficient Driving of a Motor Vehicle Transporting Munitions," Munitions Carriers Conference, 1424 Sixteenth St., N.W., Washington 6, D. C.

7. "Safety in the Handling and Use of Explosives," Institute of Makers of Explosives, 250 East 43rd Street, N. Y. 17, N. Y.

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(Use Key # L-29 on Inquiry Card on page 73)

Plastics Industry Fires

A research report on fire hazards in the plastics industry has been published by the National Board of Fire Underwriters. The report, a revision of an earlier one published in 1946, provides essential information on the composition and classification of plastics, methods of manufacture and fabrication of finished products.

Prepared by NBFU's Committee on Fire Prevention and Engineering Standards, it also discusses a number of fire and explosion problems associated with the manufacture of basic resins, the production of molding compounds and the fabrication of end-use products. Also included is a hazard survey and safety program along with appended tables on fire properties of the principal hazardous materials, the thermo properties and burning characteristics of various plastics, and a tabulation of identifiable trade names.

In a joint introductory statement John A. Neale, NBFU's chief engineer, and Mathew M. Braidech, research director, point out that there is a special need for information directed toward fire prevention and protection problems that arise from handling flammable liquids, combustible dusts, and highly reactive materials in processing operations, many of which present serious fire and explosion potentials.

There is also a need, they say, for a better understanding of the properties of these materials and their service limitations to guard against their misuse or misapplication.

Hazards of Plastics

The insurance companies recognize the need for keeping abreast of the rapid advance of all progressive and important industries. They contribute toward the development of the fire protection and prevention measures necessary to insure safe operation at the commercial peaks demanded by our industrial economics. Processing raw materials, handling plastics in all stages of production and even the characteristics and ultimate uses of the finished products are within the domain of the engineering and research staffs of the insurance groups.

A survey of the various processing operations in both the manufacture of the basic plastic materials and in the production of finished goods indicates that from the standpoint of loss severity, the fire and explosion risks are greatest in the chemical manufacture of synthetic resins and molding compounds. This type of processing involves many hazardous chemicals, flammable liquids and gases, and combustible dusts. Some of the same materials are handled in the processing and fabricating of finished plastic products, although, they are in much smaller quantities and under less strenuous operating conditions.

Two Hazard Groups

The potential hazards of the plastics industry can thus be classified into two principal groups: 1. Synthetic resins manufacture and compounding of molding materials; 2. Processing and fabricating basic materials into finished plastic products.

Major problems requiring consideration in synthetic resin manufacture and the compounding of molding materials, from the hazard control and fire safety standpoint, are as follows:

(1) Hazards of highly flammable liquids and gases during processing, transportation and storage. Examples: distillation, pumping, blending, tank car handling, storage in tanks, etc.

(2) Dust explosion hazards during processing. Examples: grinding, milling, screening, blending of synthetic resins with wood flour and other materials, etc.

(3) Danger of hazardous chemicals during processing due to inadequate temperature, pressure, and reaction time controls. Examples: distillation, polymerization, autoclaving, etc.

(4) Sources of ignition in "high" hazard areas (flammable gases, vapors and dusts). Examples: open flames, static electricity, arcing of electrical equipment, lightning, sparks from metal contacts, etc.

(5) Failure of equipment processing hazardous chemicals due to improper design or lack of maintenance. Examples: excessive corro-

sion on critical equipment, failure of pump packings, etc.

(6) Fires caused by operational errors due to inadequately trained personnel or lack of understanding of the hazard potential of the materials involved. Examples: shutting off relief valves from pressure systems, accidental polymerization of plastics in the emergency relief equipment, etc.

(7) Rapid and uncontrolled spread of fire in a plant due to improper fire protection facilities, lack of trained fire fighting personnel, and poor plant layout. Examples: lack of water supply, spray and sprinkler systems, foams, inert gases, plant brigades, fire equipment; topographic considerations, segregation of hazardous operations, etc.

(8) General increase of fire hazards due to poor housekeeping and unsafe waste disposal practices. Examples: failure to plan disposal of still residues, contaminated filtering media, flammable liquid spillage, etc.

Production & Fabrication

The principal fire and explosion problems which should receive consideration in the production and fabrication of plastics are as follows:

(1) Hazards of flammable liquids used in the preparation of plastic materials and in the operation of plastic forming equipment. Examples: preparation of coating materials, solvent removal in film casting, lubricants for equipment, coating finished products, hydraulic fluids.

(2) Dust explosion hazards involving molding powders and dust residues in machining operations. Examples: use of fine plastics molding powders during processing, flash and fin removal after molding and casting operations, machining, polishing, etc.

(3) Handling and storage of hazardous chemicals. Examples: (organic peroxides) benzoyl peroxide, tertiary butyl peracetate, etc.

(4) Sources of ignition in high hazard areas. Examples: static electricity in film casting, heating devices in drying ovens, overheated bearings in process equipment, open flames from welding maintenance work, etc.

(5) Lack of safety controls on process equipment. Examples: excessive pressure and temperature

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(Use Key # L-33 on Inquiry Card on page 73)

indicators and warning devices, pressure relief devices, explosion diaphragms, etc.

(6) Fires caused by ineffectual supervision and poor training of operating personnel. Examples: careless handling of portable electrical equipment, removal of safety controls to increase production, etc.

(7) Increased fire hazard through the lack of planned fire protection. Examples: location of hazardous processes, type of water supply, use of sprinklers, inert gas, watchman service, plant brigade, etc.

(8) Fire hazards caused by poor housekeeping, inspections and maintenance. Examples: removal of dusts from operating areas, scrap disposal, lubrication of equipment, oil leaks, etc.

An examination of the physical and chemical properties of plastic materials reveals that most of them were not intended for high temperature application or exposure to fire conditions. Like most organic compounds, synthetic resins will burn under certain conditions. While there is no special fire hazard in the generally accepted usage of plastics, a frequent re-evaluation is necessary in order to adjust to the changes in materials and to their utilization in new fields.

In fires every conceivable condition is possible ranging from complete to partial combustion or smoldering and destructive distillation. Hence, it can be readily appreciated that the wide variety of plastics and their constituent modifying agents can bring about an extensive series of toxic and nonrespirable by-products of varying concentration.

Buildings used for the manufacture of molding materials, sheet plastics, laminated products or the production and assembly of plastic items should be constructed in conformance with the National Building Code. Particular consideration should be given to the use of fire resistive construction or noncombustible construction protected by automatic sprinklers. Vertical openings for elevator shafts, stairways, and material chutes should be protected to avoid the rapid spread of fire. Fire walls should be used to limit the size of excessively large floor areas. Explosion venting should be provided in rooms where explosion hazards exist.

Process units should be in locations that make them accessible to fire control operations. One guiding principle is the prevention of fire spread through exposure by adequately separating process equipment, storage areas, and other facilities. Those operations which are considered particularly dangerous should be segregated.

In conclusion, the report emphasizes that fire safety in plastics manufacturing plants depends on a well developed program for inspection, maintenance and good housekeeping. A thorough inspection service in a plant conducted by members of the engineering and safety departments will generally increase the efficiency of production in addition to providing a better record with regard to fires and explosion. Inspections should establish that equipment is suitable for the intended operation and will not fail unexpectedly. By keeping a constant check on wear and corrosion rates of equipment, it is possible to anticipate replacements or repairs, and guide preventive-maintenance operations. The types of equipment that require periodic inspection and maintenance are:

1. Process Equipment, such as, furnaces, heat exchangers, piping, pumps, compressors, motors, polymerizers, autoclaves, stills, instruments, pressure relief valves, and flash-back arrestors.

2. Utility Equipment, such as, main boilers and heat producing units, electric generators, water supply, storage and distribution systems, steam and compressed air distribution systems, etc.

3. Tanks and Auxiliary Equipment, such as, various types of storage tanks, connecting piping, gauges and measuring instruments, dikes, drains, vacuum and pressure relief devices, flame arrestors, breathing and emergency relief equipment, etc.

4. Plant Buildings, Transportation, Shipping and Storage Areas, and Equipment, such as, tank cars, transfer pumps, etc.

5. Fire Protection Equipment, such as, water storage, piping and pumping facilities (for fire use), permanent installations of foam, fog, spray, gas, or dry powder extinguishing systems, first aid fire extinguishers, fire trucks and pumpers, alarm systems, etc.

Inside the Trade

STOP-FIRE, INC. has announced details of a new plant and home office, now under construction in South Brunswick, New Jersey. The company expects to occupy its new quarters in early 1956. The new plant, which will provide greatly expanded facilities for production and warehousing of its fire extinguishers, is the first unit of a proposed "Fire Fighting Center" that will cover 100 acres. The property is located on U. S. Route No. 1 at Black Horse Lane, seven miles south of New Brunswick, N. J. Future plans call for other major units: a modern research laboratory, elaborate testing grounds, and eventually a training school.

AMERICAN STANDARDS ASSOCIATION, INC. has announced the election of J. L. Cranwell, vice president of the Pennsylvania Railroad Company, New York, as president of the association.

Mr. Cranwell will fill the post left vacant by the death of Edward T. Gushée, vice president of the Detriot Edison Company. Mr. Cranwell became a member of the Board of Directors of the American Standards Association, representing the Association of American Railroads, in January 1953. He was elected vice president of the Association on January 1, 1955.

THE YALE & TOWNE MANUFACTURING COMPANY has been granted Factory Mutual approval for its full line of LP-Gas powered industrial lift trucks. The company had previously been granted approval by Underwriters' Laboratories. The approvals cover both permanently mounted ASME containers and detachable ICC containers.

A-P CONTROLS CORPORATION, Milwaukee Wisconsin manufacturers of refrigeration and heating controls announces the appointment of *Arthur W. Krause* as chief methods engineer. Mr. Krause will replace Mr. Ed Solski who has been promoted to the position of chief industrial engineer.

ROBERT PERRY TYLER, Vice President in Charge of Sales of *MACWHYTE COMPANY*, died at his home October 2, 1955, in Kenosha, Wisconsin. He was born at Roanoke, Virginia, October 7, 1897, and was widely known throughout the wire rope industry. Mr. Tyler joined Macwhyte Company in 1945 as General Sales Manager, was elected a director in 1946, and appointed Vice President in Charge of Sales in 1947. Prior to his association with Macwhyte Company, he was employed by John A. Roebling's Sons Company of Trenton, New Jersey, and A. Leschen & Sons Rope Company of St. Louis, Missouri, as General Sales Manager.

ANSUL CHEMICAL CO. has announced a three-point capital expansion program consisting of an addition to the company's mechanical manufacturing facilities in the fire equipment division, and new chemical plant buildings for the manufacture of sodium bisulfate and niacin. The proposed $100,000 addition will enlarge the fire equipment production area by about 12,000 square feet. The space will be used for the fabrication of larger equipment.

PORTOMAG SALES INC. has been formed to handle both national and foreign sales and service of Portomag units, the new portable magnetic drill press manufactured by Lupear's Tool and Die Co. of Farmington, Michigan. Headed by *R. S. Ebbert* and *R. R. McLeese*, the new organization will be located at 1511 E. Nine Mile Road, Ferndale 20, Michigan. Branch sales and service offices will be located in principal industrial areas throughout the country.

WYANDOTTE CHEMICALS CORP. has recently promoted *Stanley Johns* to District Sales Manager of the J. B. Ford Division St. Louis office. He will supervise a sales force covering Missouri, Arkansas, Western Tennessee and Southern Illinois, servicing all industries which use commercial cleaners, germicides, and floor absorbents.

The company has also announced the opening of enlarged technical service laboratories for the J. B. Ford Division, both in Wyandotte, Michigan and in Los Nietos, California—near Los Angeles. These enlarged headquarters facilities enable the more than 200 Wyandotte Chemicals resident representatives to give faster "trouble shooting" service.

PARKER SWEEPER CO., of Springfield, Ohio, has appointed *BRINKER SUPPLY COMPANY*, (6545 Hamilton

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LEGGE Safety Polishes give your floors gleaming, durable surfaces—yet their coefficient of friction goes up to *75% beyond* U. L. requirements for slip-resistance. Many administrators report reductions of *98%* and *more* in slip-accidents.

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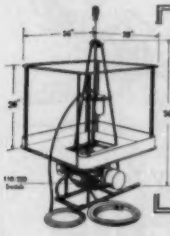
Models are lightweight — electric 175 lbs., air 160 lbs. Powered by ¾ H.P. General Electric motor. Speed 20 ft. per minute. 150 ft. of 5/16" cable. Operated on 110 or 220 volts.



Baskets are interchangeable with electric or air power.

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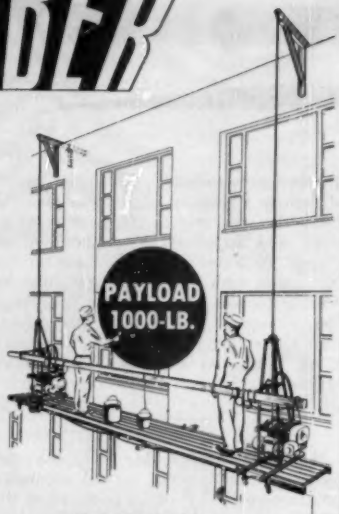

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WELDING CURTAINS—SALVAGE COVERS

to confine the welding operation to a given area

used to protect machinery, and other equipment from water, dust and snow.

MADE OF CANVAS

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Avenue) Pittsburgh, Pa., as a sales and service distributor for its maintenance products in western Pennsylvania and part of West Virginia.

THE PIONEER RUBBER CO., of Willard, Ohio, has announced the formation of a Hand Protection Clinic to help industrial concerns solve problems relating to employee hand protection. The service is free and any firm can write a description of its hand protection problems to the clinic, where the facts will be analyzed and recommendations made for the right glove for the particular job involved.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, OF SAFETY MAINTENANCE AND PRODUCTION, published monthly at Rensselaer, N. Y., for October 1, 1955.

State of New York, County of New York, ss. Before me, a Notary Public in and for the State and County aforesaid, personally appeared Arthur Snyder, who, having been duly sworn according to law, deposes and says that he is the business manager of SAFETY MAINTENANCE AND PRODUCTION, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management and circulation of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in Section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editors and business manager, respectively, are: Publisher, Alfred M. Best Company, Inc., Executive Offices, 75 Fulton Street, New York, N. Y.; Editor-in-Chief, Alfred M. Best; Managing Editor, C. M. Kellogg; Editor, Harry Armand; Business Manager, Arthur Snyder; all of 75 Fulton Street, New York, N. Y.

2. That the owner is Alfred M. Best Company, Inc., 75 Fulton Street, New York, N. Y.; and that the owners of 1% or more of the stock are: Mrs. Annie V. Ammermuller, 255 West 102nd Street, New York, N. Y.; Mildred B. Baird, 86 Prospect Avenue, Montclair, N. J.; Alfred M. Best, 75 Fulton Street, New York, N. Y.; Randolph C. Betts, Montreal, Canada; Clem and Company, Boston, Mass.; Crum and Forster, 110 William Street, New York, N. Y.; Flitcraft, Inc., 75 Fulton Street, New York, N. Y.; Kellogg and Company, Westfield, N. J.; Alice L. Kellogg, 615 Tremont Avenue, Westfield, N. J.; Chester M. Kellogg, 615 Tremont Avenue, Westfield, N. J.; Frank J. and Eleanor Matre, 10 South LaSalle Street, Chicago, Ill.; Estate of John McElraevy, 75 Fulton Street, New York, N. Y.; Raymond T. Smith, 10 South LaSalle Street, Chicago, Ill.; Vance C. Smith, 20 No. Wacker Drive, Chicago, Ill.; Arthur Snyder, 75 Fulton Street, New York, N. Y.; Mrs. Kathryn Snyder, 85 Eton Road, Garden City, N. Y.; William E. Whitney, 139 Clifton Street, Belmont, Mass.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities are: None.

4. That the two paragraphs next above giving the names of the owners, stockholders and securities holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees hold stock and securities in a capacity other than that of a bona fide ownership; and this affiant has no reason to believe that any other person, association or corporation has any interest, direct or indirect in the said stock, bonds or other securities than as so stated by him.

ARTHUR SNYDER.
Business Manager.

Sworn to and subscribed before me this 13th day of September, 1955.

ELIZABETH BRENNER
Notary Public, State of New York
No. 24-0407700
Qualified in Kings County
Cert. filed N. Y. County Clerk
Commission Expires March 30, 1957

Material appearing in this section is published as information for our readers and is not intended to imply endorsement or guarantee by SAFETY MAINTENANCE.

What's New...

For your convenience in obtaining descriptive literature of products listed here, use the Reader's Inquiry Card. Just write in the code number given with each item. Or send written requests to:

Service Dept.,
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SAFETY EYEWEAR FRAME

(Use Key # 651 on Inquiry Card on page 73)

A RUGGED new safety eyewear frame for use by men or women workers has been developed by Bausch & Lomb Optical Co. Known as the "Titan", it is claimed to be the first combination metal-and-plastic industrial safety frame. It combines the strength of metal with the adaptability of plastic. Safety features include: a frame of nonflammable acetate butyrate, extra tough to withstand breakage, and fully cured to hold its shape; a metal bridge, plated to resist corrosion, and held to the frame with four rivets for maximum strength; adjustable nose pads which are an integral part of the bridge. Rigid pads are also available.

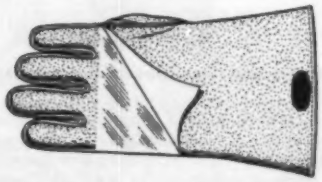
The new frame features safety-cross plaques on the front temple corners which identifies them instantly as safety glasses with safety lenses. The "Titan" has a large, modern lens shape which is attractive and functional. It provides a broader horizontal field of vision and offers a better location for bifocal segments.

According to Bausch & Lomb officials, the new frame answers the demand by safety people for equipment which is attractive to workers as well as sturdy and utilitarian. They have modern ophthalmic styling, and come in a warm-toned neutral gray shade.

COLD DEGREASING SOLVENT

(Use Key # 652 on Inquiry Card on page 73)

A SOLVENT for cleaning metals contaminated with greases, oils, tars and waxes has been developed by The Dow Chemical Co. for cold-cleaning, dip-cleaning and bucket-cleaning operations. Called "Chloroethane," it is an inhibited grade of 1,1,1-Trichloroethane. While its solvent properties closely parallel those of carbon tetrachloride, Chloroethane is one of the least toxic of the chlorinated solvents, but, like them, has comparatively low flammability. While the solvent is not recommended for vapor degreasing, it is suitable for cold cleaning of all types of metals, including aluminum under ordinary conditions.



INSULATING WELDER'S GLOVE

(Use Key # 653 on Inquiry Card on page 73)

FOR WELDING, burning, furnace and other high temperature jobs where burn hazards and acute discomfort can result from radiant heat, a new type of heat-insulating glove has been developed by the Olympic Glove Co. Known as the "Al-Cool", the new glove utilizes an interlining of aluminum foil to shield the back of the hand. The bright metal foil is said to reflect as much as 95 percent of the radiant heat back toward the source. The foil interliner covers the entire back of the hand from wrist to knuckles.

This new type of glove is immediately available in three styles of welders gloves. Samples are available. Special designs, including aluminum foil interlining for palm protection, can be made to order.

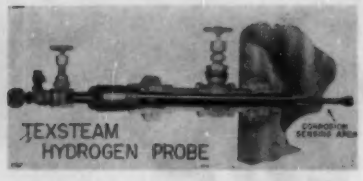
WIDE VISION FACE MASK

(Use Key # 654 on Inquiry Card on page 73)

THE "SCOTTORAMIC" face mask manufactured by Scott Aviation, offers unusual visibility over former type masks. Said to be an entirely new concept in design, the new mask incorporates the "wrap-around windshield" idea and does away with the two separate eye-pieces.

The mask has been thoroughly tested in action and is endorsed by leading fire-fighting, industrial safety, and airline officials. In addition to unlimited visibility, the mask dispels all feeling of claustrophobia. Non-fogging is assured by the circular air-washing action of the cool air or oxygen supply. The plastic safety lens is virtually unbreakable.

Because of greatly increased side and forward vision, industrial employees can work longer with less fatigue, fire fighters perform emergency and rescue operations with greater safety and confidence, aviators are able to wear the mask even while landing aircraft, according to the manufacturer. A double lip seal makes the mask comfortable when worn for a long time . . . even over glasses. It may be donned with one hand, leaving the other free for use in emergency situations. Microphone and air hose are optional equipment.



TANK CORROSION DETECTOR

(Use Key # 650 on Inquiry Card on page 73)

A WARNING safety device for the oil refining and chemical processing industries has been developed by Texsteam Corp. Their Hydrogen Probe gives a warning indication on a pressure gauge that dangerous hydrogen blisters are corroding the walls of metal tanks in which chemical reaction is in process under pressure.

The device is made of seamless carbon steel tubing. One end is closed and machined to make a thinner walled section which acts as the corrosive-sensing-area. This end is inserted into the chemical processing tank, the other end extending outside the tank is held in position with fittings and pressure tight packing.

If inside the tank there is the right combination of hydrogen-ions, sulfides, temperature and/or acidic compounds that can penetrate steel and form hydrogen blisters, these blisters will be formed inside the thinner walled section of the Hydrogen Probe before excessive damage is done to the wall of the tank. The hydrogen from the blister will show its presence on the pressure gauge on the probe outside the tank.

The probes are removed and inspected or replaced from pressure processing tanks without taking the tank out of production or off the stream. They are made 18", 24" or 36" long for different size processing tanks and are available in three different types of mountings—flanged, threaded or pressure lubricated.

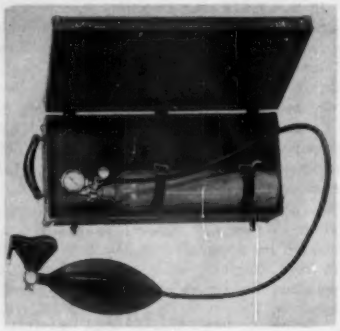
INSIDE LOCK RELEASE

(Use Key # 656 on Inquiry Card on page 73)

IN LARGE PLANTS, office buildings, or public structures there is an ever-present danger of some employee or tardy visitor being locked inside at the close of the day. A new device, just introduced by American Allsafe Co. of Buffalo, N. Y., claims to prevent this. It is attached as an extra to their standard Emergency Lock Release, which serves a similar function on the outside of the door.

The new Inside Lock Release is attached inside the door, gate or window and a prominent red label bears the inscription—"In an emergency, to open door, strike this button." When the button is hit, it breaks a control glass on the outside of the door (or gate). This automatically releases a pin which holds the hasp padlock in place. The door can then be pushed open. The device may be quickly reset by inserting another special glass panel in the Lock Release. To prevent unauthorized use, the release may be attached to a closed circuit electric alarm system and activate a siren, bell or warning light, either at the same location or a distant location, such as the desk of the plant guard or watchman.

Quickly and easily installed, it is fully guaranteed by the manufacturers. Another use is for plants that keep windows permanently closed because of air conditioning systems. By attaching this device to the windows, they may be padlocked on the outside, yet instantly opened from the inside in case of fire or other emergencies.



RESUSCITATOR-INHALATOR

(Use Key # 657 on Inquiry Card on page 73)

A NEW PORTABLE oxygen unit designed for the emergency administration of oxygen for resuscitation or continuous flow therapy is being manufactured by the Ohio Chemical & Surgical Equipment Co. It is recommended for emergency use by physicians, in dental offices, in hospitals, by ambulance services, police and fire departments, civil defense units, in industrial plants, power companies and mines.

The unit consists of the carrying case, yoke for medical-type cylinder valves, needle valve control with pressure indicating gauge, supply tubing, collector bag, inhaler assembly modified to limit positive pressure to approximately 20 MM. Hg., face mask, and cylinder wrench.

When used for resuscitation the needle valve is opened wide to permit the bag to fill while the mask is held in position on the patient's face. Pressure is then applied to the bag by squeezing to force the oxygen into the patient's lungs. For continuous flow therapy administration the flow of oxygen is limited to the amount necessary to keep the bag slightly distended through the inhalation phase of the patient's respiration.

20,000-VOLT HATS

(Use Key # 658 on Inquiry Card on page 73)

A SAFETY HAT for high voltage areas is being marketed by General Textile Mills, Inc. Made of a special plastic, the Gentex Safety Hat is said to have a dielectric resistance of over 20,000 volts and exceeds all Federal and E. E. I. specifications. There are no holes, bolts, rivets or metal parts to conduct either electricity or heat. The hat also meets penetration test, drop test and flammability test requirements to assure positive head protection from falling or moving objects as well as electricity.

The hat is designed for wearer comfort: headband is shaped to fit the contours of the head and is adjustable in size; space between head and shell provides cool ventilation and protection against impact blows; the nylon and plastic sling assembly snaps in and out and is washable; total weight is 15 ounces. Available in several permanently impregnated colors and in two models: hat with full brim, or cap with front brim.

In addition to the hard hats for high voltage areas, the company is also offering general purpose hard hats for construction, steel, lumber, oil and other industries. They protect the head from falling and moving objects, insulate against heat and sun, and have dielectric resistance of over 10,000 volts.

IN-PLANT FIRE TRUCKS

(Use Key # 659 on Inquiry Card on page 73)

INTRODUCTION of a complete line of easily maneuverable In-Plant Fire Trucks has been announced by the Ansul Chemical Company. Designed to carry a wide assortment of fire fighting equipment and especially adaptable to the needs of plant fire brigades, the trucks are being manufactured by St. Clair Industries and will be

(Continued on page 75)

FREE BULLETINS & CATALOGS

As a convenience to executives, these new publications of manufacturers are offered by the Reader Service Department of SAFETY MAINTENANCE & PRODUCTION. To obtain copies write in the key numbers on the free-postage card below.

DUST & FUME CONTROL

Five Basic Dust Problems 413
American Air Filter Co., Inc. Well illustrated and informative bulletin shows various types of dust collectors designed for the five basic types of dust problem: moderate dry, granular; medium loadings of fine; heavy loadings of all sizes; high loadings of dry granular; extremely fine dry particles.

Hazardous Gas Detector 414
Taller & Cooper, Inc. An unusually versatile gas detector is described in this 4-page bulletin. The unit can detect low concentrations of toxic or combustible gases, such as benzene, toluene, gasoline, alcohols, carbon monoxide, acrolein, hydrogen sulfide, saturated hydrocarbons, etc.

Fume Control System 415
Martin Equipment Co. This 4-page illustrated bulletin describes a mobile dust & fume collecting system for metal foundry and pouring operations. Collecting hood is suspended from overhead pouring ladle carriage.

LIGHTING & ELECTRICAL

Emergency Lights 416
Electric Storage Battery Co. This 8-page catalog describes a full line of U.L. approved battery-powered emergency lights of the permanent connection, auxiliary plug-in and battery-only types. Contains diagrams, charts & specifications useful to safety engineers, architects, builders, purchasing agents, etc.

Enclosed Switches 417
Micro Switch. A new 28-page catalog covers a complete line of industrial enclosed switches, for a.c. or d.c. applications. Includes general purpose, sealed, heavy-duty limit, hand-operated and contact types available in various designs and ratings.

Electric Tools 418
Porter-Cable Machine Co. Portable electric tools and kits for builders, carpenters, plumbers, electricians and maintenance crews are described and illustrated in this 25-page catalog. Includes saws, sanders, drills, planes, routers, shapers, grinders, grass trimmers, etc.

25 Lighting Solutions 419
Graybar Electric Co., Inc. The solutions to 25 industrial lighting problems are described and unusually well illustrated in this formative 28-page brochure. These case histories cover a wide range of lighting needs and include data on type, size and spacing of lighting units.

Grounded Lamp Guards 420
McGill Mfg. Co. Illustrated bulletin describes a line of grounded portable extension lights. Units consist of metal cages grounded internally in the molded phenolic handles which may also have a 3-plug convenience outlet for grounding drills or other tools

MAIL POSTAGE PAID CARD FOR MORE DATA

Battery Searchlight 421
Justrite Mfg. Co. Small, portable searchlights that operate on self-contained dry batteries are described in this bulletin. Suitable for emergency use, models include 12-volt and 6-volt types.

Electric Cable Vulcanizers 422
Joy Mfg. Co. This 16-page catalog describes, illustrates and gives full specifications for various kinds of electric cable vulcanizers. In addition to portable, kit box, and steam heated types, the catalog gives data on vulcanizing supplies and information on how to use the products.

PERSONAL PROTECTION

Hard Hat Winter Liners 423
E. D. Bullard Co. Five types of winter liners for safety hats and caps are illustrated in this bulletin. They provide comfort to outdoor workers in cold and stormy weather. Includes water repellent, knitted and face-shielding types.

Stringer's Tool Pouches 424
Utilities Safety Supply Co. A wide variety of leather tool pouches for stringers, linemen and electricians are described and illustrated in this 8-page bulletin. Includes open, flap, and multiple pouches, bolt & nut bags, belts, etc.

MAINTENANCE

Monolithic Lining Armors 425
Klemp Metal Grating Corp. Illustrated brochure shows uses of open steel gratings as armors and retainers for castable refractory monolithic linings in cat crackers, reactors, regenerators, heaters, strippers, stacks, ducts, furnaces, tanks, etc.

Wood Floor Bulletin Poster 426
National Sanitary Supply Association. This large bulletin board poster highlights the causes and cures of some of the common problems of wood floors. Emphasis is on the need for sealing wood against water and other liquids and against traffic erosion.

Vibration Isolation 427
The Felters Co. This illustrated reprint of a magazine article, "The Story of Vibration Isolation", explains what the isolation of machinery is, how noise & vibration are reduced, and what methods and materials can be used.

EDUCATIONAL & VISUAL AIDS

Efficiency Signs 428
Stonehouse Signs, Inc. This 4-page folder, illustrated in full color, shows a variety of safety and efficiency signs, with the general theme that a safe worker is a more efficient worker. Includes sizes and prices for these enamel-metal signs.

Safety Incentive Program 429
Award Incentives, Inc. This illustrated bulletin outlines the features of a successful

(Continued next page)

SPECIAL OFFER BELOW VALID ONLY FOR THREE MONTHS AFTER PUBLICATION DATE

READER'S INQUIRY CARD

HOW TO GET FREE DATA! **(No Postage Required)**

ADVERTISED PRODUCTS: Just insert the key number shown under each advertisement in the boxes below.

NEW PRODUCTS ("WHAT'S NEW" PAGES): Insert the key numbers shown on each item.

FREE BULLETINS & CATALOGS: Insert the key numbers shown on this page.

November, 1955

Please send me the following free data (Remember to fill in your name and address.)

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Name _____ Title _____

Company Name _____

Street Address _____

City _____ Zone _____ State _____

Free Bulletins (Cont'd)

program to promote safer driving in a trucking fleet. Gives a case history of a program utilizing pins, watches, rings, knives, pens, etc.

Double-Message Signs 430
Irwin-Hodson Co. This bulletin includes a sample of the laminated plastic from which these signs are made. The series of plastic lenses are arranged so that two different safety messages, in different colors, can be seen depending on the position of the observer.

WASHROOM SANITATION

Waterproof Skin Cream 431
Cadet Laboratories, Inc. Illustrated folder describes a protective skin coating containing lanolin that is unaffected by perspiration and shields the skin from most acids, alkalis and other aqueous solutions.

Clean Washrooms 432
U. S. Sanitary Specialties Corp. New pamphlet points out the importance of clean washrooms as a key to good public relations, whether users are employees, patrons, customers or patients. Folder also lists various products that help keep washrooms sanitary and attractive.

Cream Deodorant Soap 433
Sugar Beet Products Co. This bulletin outlines how a cream type of antiseptic soap eliminates soap waste in washrooms, is economical, and reduces maintenance work. Also includes information on dispensing equipment.

ACID HANDLING

Safety Siphon 434
Alden Speare's Sons Co. A new safety siphon is described in this well illustrated 4-page folder. Features are the plastic tubing that resists most chemicals, and the flow-control valve that varies the siphoning speed.

Acid Handling Equipment 435
American Agile Corp. Illustrated bulletin outlines the various types of products made by this company: acid-resistant plastic; plastic fabricating equipment; fabrication & installation service; laboratory ware, vapor & fume exhaust systems, fans, tanks, etc.

What's YOUR Problem?

- **Has an accident or fire interrupted production?**
- **Want to know how to prevent it?**
- **Do you need background information on equipment for industrial safety, hygiene, or maintenance?**

As a service to its readers, "Safety Maintenance" will arrange to supply manufacturers literature on the following subjects. Just insert the key number on the Readers Inquiry Card on the preceding page and be sure to fill in your name and address. If you need information on a specific type of product, simply write it in on the Inquiry Card.

Key Number	Subject
	PERSONAL PROTECTION
101	Safety Goggles
102	Face Shields
103	Lens Cleaning & Anti-Fogging Equipment
104	Sweat Band
105	Hard Hats
106	Respirators & Masks
107	Protective Clothing
108	Women's Protection Clothing
109	Safety Belts
110	Safety Gloves
111	Foot Protection
112	Anti-Slip Soles
113	Oil-Proof Soles
114	Welding Helmets
115	Welding Curtains
	FIRST AID AND PERSONAL HYGIENE
120	Protective Skin Cream
121	Skin Cleansers
122	Sanitary Drinking Facilities
123	Athlete's Foot Control
124	Salt Tablets
125	Noise Analysis & Control
126	Antiseptic Medication
127	Burn Medication
128	First Aid Kits & Supplies
129	Stretchers & Litters
130	Resuscitators
131	Eye Wash Fountains
	DUST & FUME CONTROL
135	Portable Ventilator
136	Dust & Fume Collectors
137	Carbon Monoxide Control

Key Number	Subject
	FIRE PROTECTION
140	Fire Extinguishers
141	Safety Cans
142	Extinguishing Ashtray
143	Safer Solvents
144	Degreasing Machines
145	Combustion Safeguards
146	Flammable Liquid Pumps
147	Fire Retardants
	LIGHTING EQUIPMENT
150	Alarms & Warning Lights
151	Explosion-Proof Lights
152	Electrical Insulation Tester
153	Fluorescent Lamp Guards
	FLOOR & BUILDING MAINTENANCE
160	Anti-Slip Floors & Mats
161	Anti-Slip Waxes & Finishes
162	Floor Cleaning Compounds
163	Cleaning Machines
164	Oil & Grease Absorbents
165	Paints
	LADDERS & SCAFFOLDS
170	Ladders & Safety Devices
171	Scaffolds
172	Work Platforms
	GUARDS
175	Machine Guards
176	Power Press Feeders
177	Overload Guards
	EDUCATIONAL AIDS
180	Safety Signs
181	Aisle Marking Equipment
182	Safety Awards & Emblems
183	Employee Safety Guide

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READER'S FREE INQUIRY CARD

for further data

ON

ADVERTISED PRODUCTS,

NEW PRODUCTS,

FREE BULLETINS & CATALOGS

WHAT'S YOUR PROBLEM?

What's New

(Continued from page 72)

distributed exclusively through the Ansul sales organization.

Employing a Kalamazoo chassis, the trucks are available in six basic models. The KB 8 Model, featuring a 300 lb. Ansul dry chemical unit backed up by a 150 gallon water fog system, is expected to find wide application in industry. Other units utilizing dry chemical-carbon dioxide combinations, water fog-carbon dioxide combinations or solely water are available, depending on the types of hazards to be protected. These units are offered on either a three-wheeled 42" wide chassis, suitable for in-plant use, or a four-wheeled 48" wide chassis with more road clearance and a larger engine for indoor-outdoor use. Trucks are 10' long and 5'8" high.

Accessories available on the units include ladders, utility bar, light, hose, portable fire extinguishers and extra nozzles, all mounted with panic-proof, quick release brackets to make their removal by one man simple and fast, even in darkness. An accessory cabinet on the truck provides adequate storage room for fire blankets, boots, air masks, coats, first aid kits, etc. In addition, a flashing red light can be mounted on top of the cabinet.

NON-SLIP STAIR TREADS

(Use Key # 660 on Inquiry Card on page 73)

WORN STAIRS can be leveled and made non-skid through the application of "Stairmaster" extruded aluminum safety treads. Not only will the stairs be made slip proof, but the heat-treated aluminum treads will add beauty to the stairs, according to the manufacturer, Wooster Products, Inc.

Eleven abrasive ribs dovetailed into the safety treads insure their slip-proof quality. Repairing worn stairs in this manner is said to be less expensive than rebuilding the worn treads. More and more aluminum is being used in architecture and extruded aluminum safety treads blend with the decor of most buildings.

The new safety treads come in a standard width to fit all stairs and are factory cut to length as required. The treads are drilled for easy installation, and the manufacturer can also provide leveling compound for leveling worn steps.

STOCK ROOM SERVICER

(Use Key # 661 on Inquiry Card on page 73)

THE INTRODUCTION of a new "Stock Room Servicer" has been announced by Atlas Industrial Corp. This new unit makes everything in the stock room easily accessible. It is easy to make use of the high, hard-to-get-at spaces in stock rooms, warehouses, etc. The Stock Room Servicer is easily rolled and easily maneuvered in aisles, hallways, doorways and other light spaces. The unit can reach any desired height and collapses to 42". It can raise or lower heavy materials. Electrically operated on house current or battery. Ladders are furnished on either side or both sides to users specifications.

HEAD AND FACE SHIELD

(Use Key # 662 on Inquiry Card on page 73)

A CLEAR acetate visor which gives excellent frontal and side face protection against abrasive particles, flying objects and chemical splashes, has been developed by Mine Safety Appliances Company. Called the M-S-A Skullgard-Faceshield, it can be attached to any M-S-A protective hat without marring the hat and can be installed or removed in seconds. An aluminum pivot arm permits the shield to be swiveled up or down in any desired position. The visors are easily detached from the pivot arm for replacement.

HYDROGEN SULFIDE REPLACEMENT

(Use Key # 663 on Inquiry Card on page 73)

FROM THE Fisher Scientific Co. comes a high-purity reagent Thioacetamide with individual lot analyses. Assay: 98.5% melting point: 112–114°C; residue upon ignition: 0.01%. The reagent can be used as a satisfactory substitute for gaseous hydrogen sulfide. Although hydrogen sulfide has been used for years in both qualitative and quantitative analysis, its disadvantages include toxicity and odor.

Thioacetamide does not have these disadvantages, and it will perform some analytical separations impossible with H_2S. Other benefits are: its precipitates are coarsely crystalline, dense, easily filterable, less contaminated with foreign ions; by controlling the temperature of the thioacetamide solution, you can control the rate of hydrolysis, thereby regulating the rate of precipitation of the sulfide; no special equipment is required for its use, such as gas generators, delivery tubes; because cations can be precipitated with very small amounts, a hood is seldom needed.

INDUSTRIAL TRAFFIC MIRRORS

(Use Key # 664 on Inquiry Card on page 73)

THE ADDITION of two larger sizes of circular convex glass mirrors to their present line of Klear-Vu Safety Mirrors for industrial use is announced by Lester L. Brossard Co. One size measures 30" in diameter, the other 36" in diameter.

Klear-Vu Safety Mirrors are especially designed for use in factories and warehouses where blind corners, cross aisle intersections, entrances and exits present a problem because of traffic accidents. Installed in these locations at a height of 8 to 10 feet, these convex mirrors clearly reflect for a considerable distance the movement of oncoming floor traffic from opposite directions. They are easily installed and quickly adjustable for any desired angle. Mirror head is strongly supported with a patented 3 inch swivel stud assembly and a mounting bracket. The circular convex mirrors and the flat rectangular glass mirrors are also adaptable for outdoor use around parking lots, loading dock areas and other points where traffic converges.

CLIP-ON COVER LENSES

(Use Key # 665 on Inquiry Card on page 73)

A SIMPLY designed spring clip holds welder's safety spectacles or protective shields of clear or tinted plastic. Sold under the name of KIM-CLIP, it snaps in place on all types and makes of prescription lenses. Adjustable to three definite positions (Up, Out, or Down), it is light weight, convenient, practical and inexpensive. For those who wear prescription lenses, they afford positive protection in welding and grinding operations and make ideal sun glasses for outdoor wear. Made by Kimball Safety Products Co.

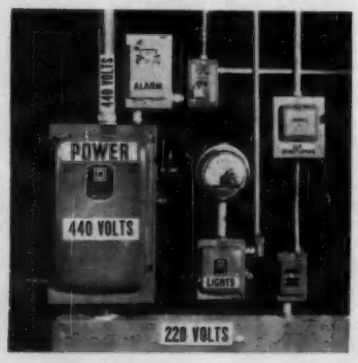
ELECTRICAL MARKERS

(Use Key # 666 on Inquiry Card on page 73)

TO FILL a vital safety and maintenance need, the W. H. Brady Co. developed a self-sticking Conduit and Voltage Marker to identify conduit, busways, circuit breakers, control centers, power switches, power lines, switchboards, transformers, utility switches and all types of electrical equipment.

The markers are made of Brady #B-500 non-conductive cotton cloth, with bold, black lettering on Alert Orange background. They come mounted on handy dispenser cards which protect the heavy, industrial-grade adhesive until used. They can be applied in seconds and will stick permanently.

Three styles are available to fit any size piece of equipment, from conduit to switch boxes. They are available from stock in all NEMA voltages from "110 Volts" to "7200 Volts" and with the names of the most common circuits, such as "Emergency Service," "Power," "Lights," "Fire Alarm," "Telephone," "AC," "DC," etc.



HAND-OPERATED CARBOY PUMPS

(Use Key # 667 on Inquiry Card on page 73)

HAND-OPERATED pumps, for all standard-size glass carboys, and designed for use where acids, alkalis, and other corrosive liquids have to be transferred in small quantities, have been developed by the American Agile Corporation. These pumps are completely fabricated of unplasticized polyvinal chloride, and are not attacked by most of the usual corrosive liquids.

Two types are available, one equipped with a plain outlet, the other with a polyethylene stopcock, for better control of the flow. Both are designed to fit tight in the neck of the carboy.

IMPROVED FLOOR MACHINE

(Use Key # 668 on Inquiry Card on page 73)

THE NEW Vestal Floor Machine for scrubbing, waxing, polishing, and light sanding features quiet operation, perfect balance, easy handling, safety switch, drip proof motor and gear assembly. It is designed with a low center of gravity, which eliminates vibration and assures a well-balanced, smooth operating machine with uniform working contact between the brush and the floor.

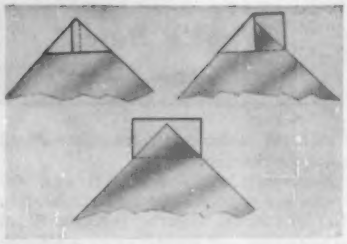
The motor is a capacitor type of simple design that does not have brushes and provides quiet operation. It has high starting torque and a built-in ventilating system. The brush-driving mechanism revolves on two heavy duty Timken tapered roller bearings and the idler gear revolves on heavy duty double row ball bearings.

The machine is available in two sizes, ½ H.P. and ¾ H.P. It carries a full year guarantee against defective material and workmanship. A full line of brushes and accessories are available.

CORNER-PADS FOR SHEET METAL

(Use Key # 669 on Inquiry Card on page 73)

THESE CORNER-PADS are inexpensive pressure-sensitive cushions designed to prevent the costly scratching and gouging of finished surfaces and injuries to employees during shop handling of sheet metal. Made by By-Buk Co., they are designed in convenient form for quick and



easy application to each corner of metal sheets at the time they are removed from the crate or bundle, and to new corners that are formed as fabrication progresses.

They are made of very tough and thick, treated paper stock having unusually high resistance to piercing. Aggressive high-tack pressure-sensitive adhesive holds them securely in position during all handling operations. Available in two sizes, with the same amount of pad protection at the corners. The larger has nearly three times as much area of adhesive contact with the metal and will therefore withstand greater displacement forces.

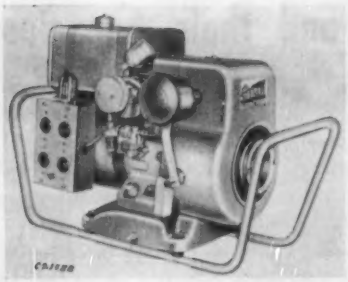
The corner-pads are supplied in rack size rolls which are partially scored so they can be separated into pocket size swatches.

PAPER TOILET COVERS

(Use Key # 670 on Inquiry Card on page 73)

FOR PUBLIC restrooms in factories, railroad and bus terminals, hotels, stores and offices, paper toilet seat covers are designed to provide a physical barrier against contact with infectious bacteria. Their use is said to reduce the cost of maintaining a clean and sanitary restroom, and enhances the over-all appearance of the area.

The Clark Paper Converting Corporation has introduced a new Shieldor brand line of paper toilet seat covers and dispensers that incorporate many major innovations. The envelope pack has a large capacity, 250 individual folded covers, for a saving in janitorial time required to re-fill. The cover design incorporates a center flap that assures automatic disposal when the toilet is flushed. The fast-disintegrating tissue will not clog the plumbing. The Shieldor Fortress model dispenser is of a new streamline design, made of durable Hi-Impact Styrene, and is available on special order in a wide range of pastel and standard colors to harmonize with modern colored fixtures and decor. A special "bar" attachment enables the installation of the dispenser on marble or tile without drilling holes.



PORTABLE ELECTRIC PLANTS FOR FIRE DEPARTMENTS

(Use Key # 671 on Inquiry Card on page 73)

A NEW LINE of portable electric generating plants, specifically designed for Fire Department use, has recently been announced by D. W. Onan & Sons Inc. Ranging in size from 750 to 2500 watts A.C., these single-cylinder electric plants provide reliable on-the-spot electric power for fire-fighting and rescue work, floodlights, tools and public address systems.

Compact, quick to start and simple to operate, these new models lend themselves to either type of normal fire rig installation . . . mounted on the running board for quick portability or permanently mounted in a compartment on the vehicle. Basic models are equipped with pilot light, grounding stud and 4-receptacle outlet box for multiple use of motor-driven equipment. Important accessories, including quick-release mounting brackets, recoil starters and carrying frames, make these portable generators more versatile than ever.

ICE MELTING PELLETS

(Use Key # 672 on Inquiry Card on page 73)

EFFECTIVENESS of "Ice Rem," ice and snow melting pellets, is increased by the addition of a new chemical ingredient, according to Speco, Inc. The new element, said to retard rust action and increase storage life, consists primarily of a specially formulated "essential" oil.

It is reputed to create a moisture seal within the container and to prevent chemical decomposition. As a result, storage life is lengthened and danger of loss when warehousing between seasons is eliminated.

Use of the new ingredient is also said to stimulate action of phosphate-type rust inhibitor. Consequently, it safeguards against excessive rust in the deicing of metal pipes, drains, downspouts, railway switches, metal loading ramps and curbs. When used on drives and streets, it retards rusting on automobiles, trucks, buses and road machinery.

According to the manufacturer, Ice Rem is an activated chemical that has 30 times the thawing capacity of salt. A light sprinkling on slippery surfaces is said to remove ice and snow without harming vegetation, rubber, asphalt and paved surfaces. It is available in 10-lb. cans, 25-lb. pails and 100, 200, 300 and 500-lb. drums.

PNEUMATIC MUFFLERS

(Use Key # 673 on Inquiry Card on page 73)

QUIETAIRE Pneumatic Silencers, which eliminate noise-shock from air-operated equipment, are now being offered nationally. Heretofore they have been supplied only to automotive manufacturers. Made by C. W. Morris Co., the all-metal units reduce sound in noise-shock areas close to the level found in the average factory (75 decibels). Tests show that operating efficiency is in no way impaired while the noise is dampened.

The silencers have no "cartridges"—no parts that need replacing. They are corrosion-resistant and are safe for any pressure normally encountered in industrial pneumatic service. Produced in four models, they will fit practically all industrial air-operated equipment. They are compact and easily attached. Distributor inquiries are invited.

ONE-MAN DOCK PLATE

(Use Key # 674 on Inquiry Card on page 73)

AN IMPROVEMENT that permits the handles and wheels of the new Rollway Steel Dock Plate to be telescoped and rotated completely out of the way has been announced by the Woodford Manufacturing Company. The new design makes moving and setting the dock plate into working position a simple one-man operation.

Once the dock plate is in position, the handles are moved forward and down, an action which lowers the plate to the floor and automatically raises the rubber-tired wheels and folds them 90 degrees to a flat position. Any load that will clear the low side rails will easily clear the wheels. Moving the plate again is a simple matter of raising the handles up and back. This automatically positions the wheels for easy rolling.

AEROSOL ANTISEPTIC

(Use Key # 675 on Inquiry Card on page 73)

A HANDY new aerosol product for soothing relief for sunburn, cuts, scratches, and bruises has been introduced by the Tru-Pine Company. According to the manufacturers, Sprayway Burn Ease kills germs and bacterial growth and reduces the danger of infection; dulls the nerve endings surrounding cuts and scratches, reducing pain; and is a non-toxic germicide.

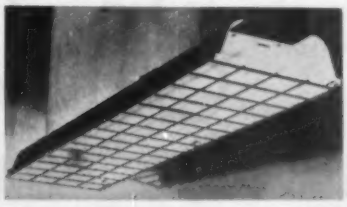
Burn Ease is simple to use. Pressure on the button releases a fine mist to cover the wound.

FLUORESCENT LIGHT GUARDS

(Use Key # 676 on Inquiry Card on page 73)

DESIGNED especially to permit use of fluorescent lighting in special industrial applications and school gymnasia, this attractive welded wire guard combines light weight and strength to meet safety regulations.

The guard requires no screws or other hardware for installation. Three retaining hinges clamp the guard firmly over the flanged edge of the reflector. On the opposite side, two wire clamps are easily released for bulb replacement.



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Gets-A-Lite Company, The	48	Read Brothers, Chicago
Hood Rubber Co.	51	Henry A. Loudon Advertising, Inc., Boston
Hynson, Westcott & Dunning, Inc.	Back Cover	
Junkin Safety Appliance Co.	30	Farson, Huff & Northlich, Louisville
Legge Co., Inc., Walter G.	69	J. M. Kesslinger & Associates, Newark
Martindale Electric Co.	50	R. J. McFarlin & Co., Cleveland
Pioneer Rubber Company, The	52	Carr Liggett Advertising, Inc., Cleveland
Pittsburgh Plate Glass Co.	23	Maxon, Inc., Detroit
Pyrene Manufacturing Co.	54	Gray & Rogers, Philadelphia
Reece Wooden Sole Shoe Co.	67	
Safe-Lad Manufacturing Company	39	The Simon Company, Portland
Safety Tower Ladder Co.	46	Walter DuBree Advertising Agency, Los Angeles
Sargent-Sowell Inc.	32	Springfield Advertising Agency, Dallas
Silicone Paper Co. of America, Inc., The	1	Packard Advertising Co., New York
Smith & Son, Inc., A.	70	John B. Ferguson, Jr., Philadelphia
Standard Signs, Inc.	66	Kenneth H. Kolpien, Cleveland
Stonehouse Signs, Inc.	Inside Back Cover	Walter DuBree Adv. Agency, Los Angeles
Tokheim Corporation	9	Jones & Taylor and Associates, South Bend
Wagco Products, Inc.	48	
Watchemoket Optical Co., Inc.	10	Richard Thorndike Agency, Providence
Wilkins Co., Inc., The	33	Laux Advertising, Inc., Ithaca
Wyandotte Chemicals Corp.	17	Brooke, Smith, French & Dorrance, Inc., Detroit

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Answers to "How Do You Look at an Accident" on page 64

Now that you have passed judgment on these accidents, let's review the answer to see how well you made out. Don't be disturbed if you didn't get a perfect score. Very few safety men have! Each case should have been scored as a "preventable" accident.

11. Caused by our driver. Raucous use of the horn serves only to panic pedestrians, causing them to recoil often into danger. Had our driver courteously slowed down, this accident would not have occurred.

12. Caused by our driver. Driver should realize that the door of any parked vehicle, along the road is apt to be swung open in his path; therefore, he should learn to drive at a distance, where practicable, at least four feet from the parked cars or just beyond the arc of the swing of a given door. Our driver could have prevented this type of accident by staying away from parked cars.

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THE safe worker really looks and acts it. He comes to the job with a feeling of security —and the standard of his work shows it.

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(For details, use Key # L-37 on card on page 73)

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